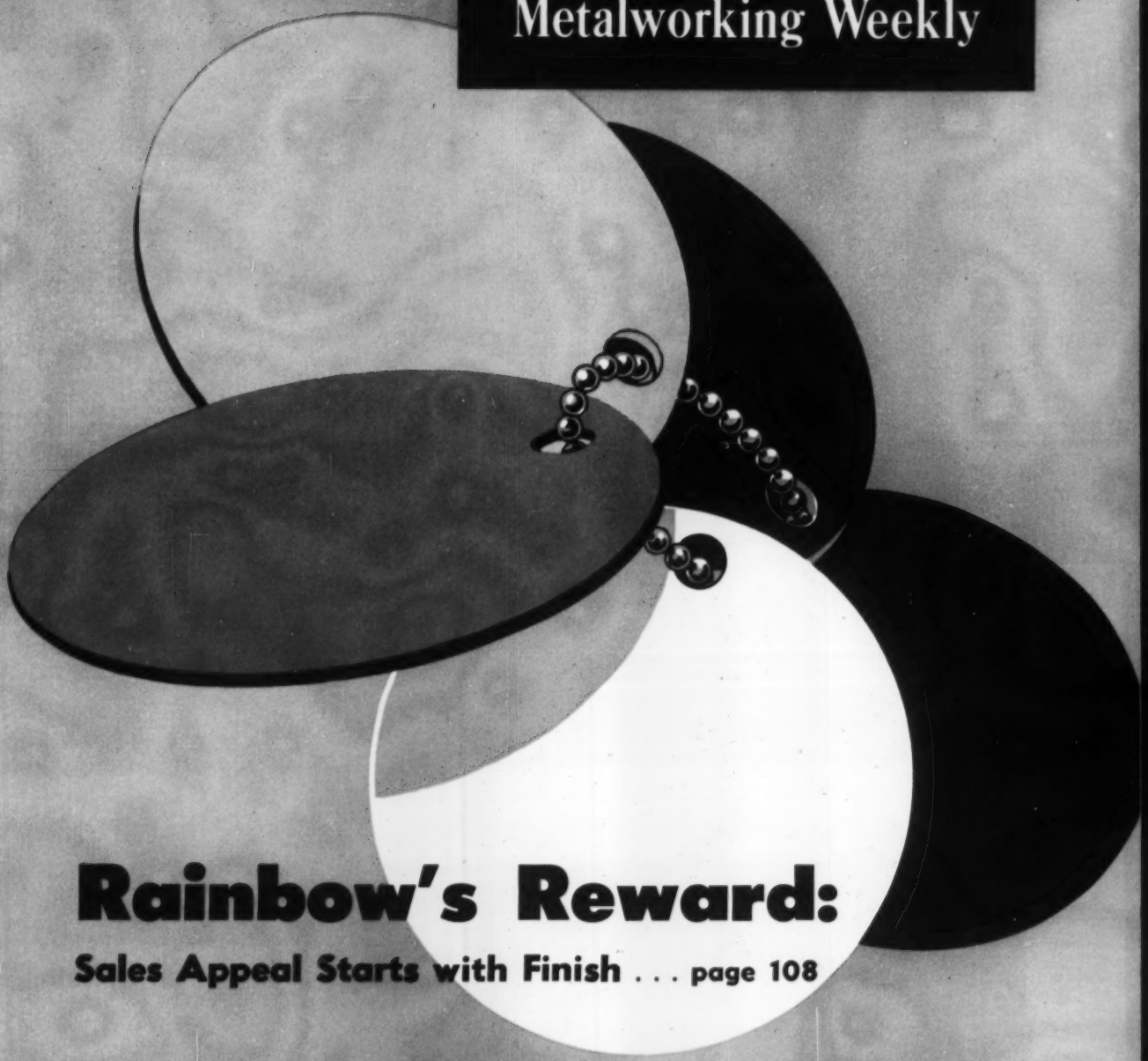
JUNE 13, 1955

STEEL
The Metalworking Weekly



Rainbow's Reward:

Sales Appeal Starts with Finish . . . page 108

✔ What Ford Settlement Means page 65

✔ More Steel for Everybody page 183

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Pre-Set Rolling of Plates With ECAM Automatic Screwdown Control. Screwdowns, edgers, and sideguards move to exact rolling dimensions automatically under single push-button operation. Operator is stationed in enclosed, elevated pulpit with clear view of all operations in this large, 150-inch plate mill. This simple ECAM control is used in several mills throughout the United States, resulting in improved product, faster rolling with extreme accuracy.

Like An Organ Player, The Operator Rolls Steel from button-panel using schedule No. 1 while an assistant prepares schedule No. 2 for a change in rolling requirements.

Also In This Same Plant Is The World's Largest Plate Mill (shown above). It has been ECAM controlled for many years.

WRITE FOR BULLETIN 9350

THE ELECTRIC CONTROL & MANUFACTURING COMPANY, 4400 East Road, Cleveland 28, Ohio

Room air conditioner sales up 600 pct

A 600 per cent jump in just five years! That's the astonishing record hung up by the room air conditioner makers. The result: a lusty new user of steel sheets virtually overnight, for most of these units are encased in housings of sturdy sheet steel.

A very sizable portion of these steel sheets are Bethlehem-made. Air-conditioning, in turn, is just one of dozens of lines of manufacturing that have grown into important consumers of Bethlehem sheets in the past few years. Add them all up, together with continuing requirements from longer-established sheet users, and it's easy to see why Bethlehem is being called on to manufacture sheets in larger volume than ever before.

And we're doing just that. Our sheet mills at Sparrows Point and Lackawanna are turning out hot-rolled and cold-rolled sheets at record pace, in the effort to catch up with unprecedented demand. Early this year we established a new all-time high in sheet production. During the following month we topped even that. And we're continuing to keep hard at it!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM SHEETS

BETHLEHEM STEEL

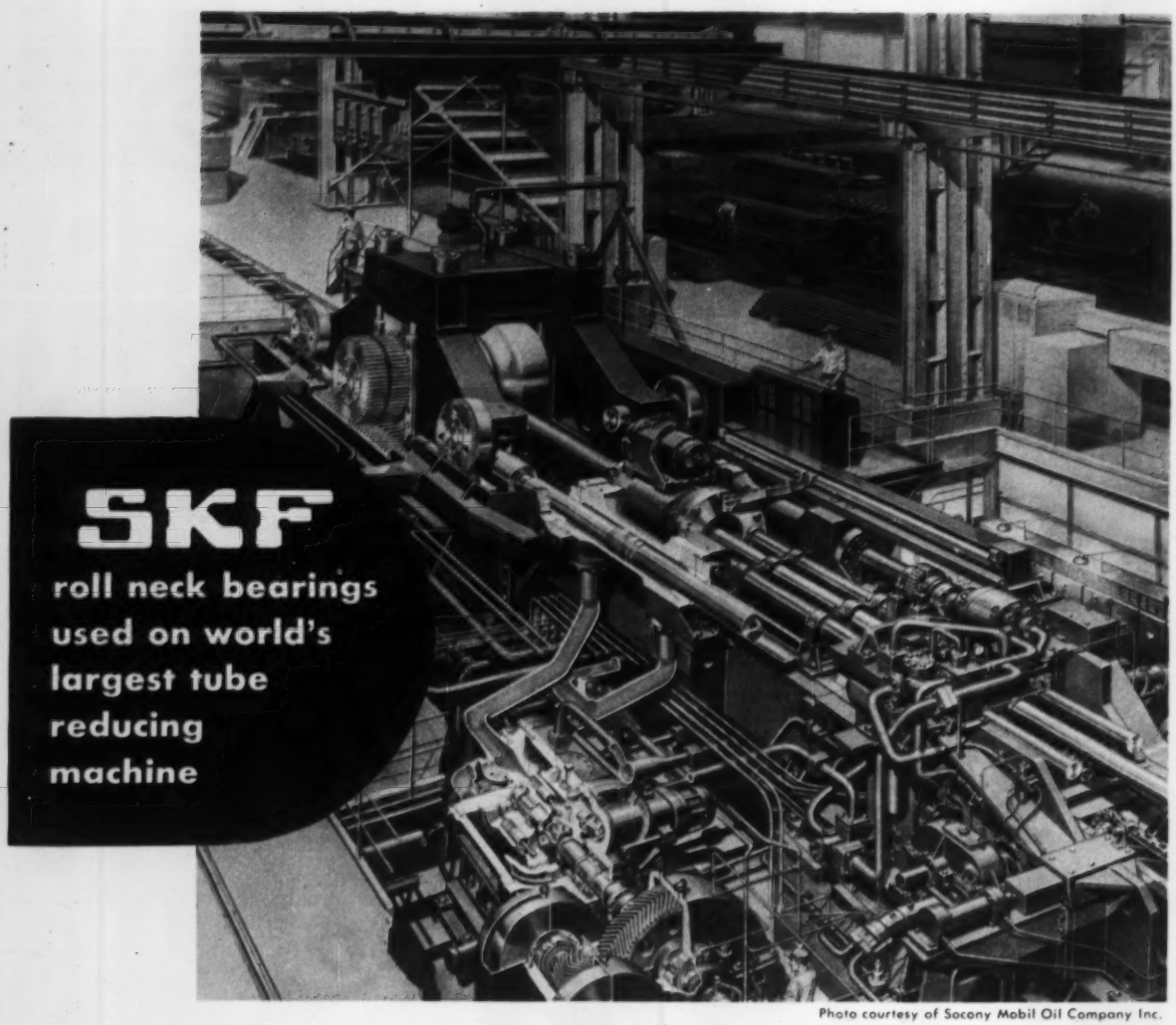


Photo courtesy of Socony Mobil Oil Company Inc.

SKF spherical absorb tremendous punishment, provide greater bearing capacity

This 102 foot long giant tube reducing machine, designed and operated by Tube Reducing Corporation, Wallington, N. J., for the U. S. Navy Bureau of Aeronautics, and built by E. W. Bliss Company, Canton, Ohio, puts a 3½ million pound squeeze on precision tubing of outer diameter sizes ranging from 9 to 17 inches for military and commercial cold finished tubular products.

The mammoth bearings for 50" diameter rolls on the machine are SKF Spherical Roller Bearings. They are the largest spherical roller bearings of this type ever made, with a rated capacity of 3,200,000 lbs. Each bearing weighs 5150 lbs.; individual rollers weigh 39½ lbs.

The Tube Reducing Corporation first employed SKF Spherical Roller Bearings in 1937 for a 2¼" tube reducing machine having 13" diameter rolls. Today, *all* tube reducers in this plant are SKF-equipped... from the smallest to the 102 foot giant.

Like the men at Tube Reducing Corporation, organizations that pioneer advancements in their fields are accustomed to find that SKF matches their vision with advanced bearing design that helps them make a working reality of their most ambitious and forward-looking plans.

Make SKF Engineering cooperation a *plus* factor in the successful realization of your company's planning and development program. 7631

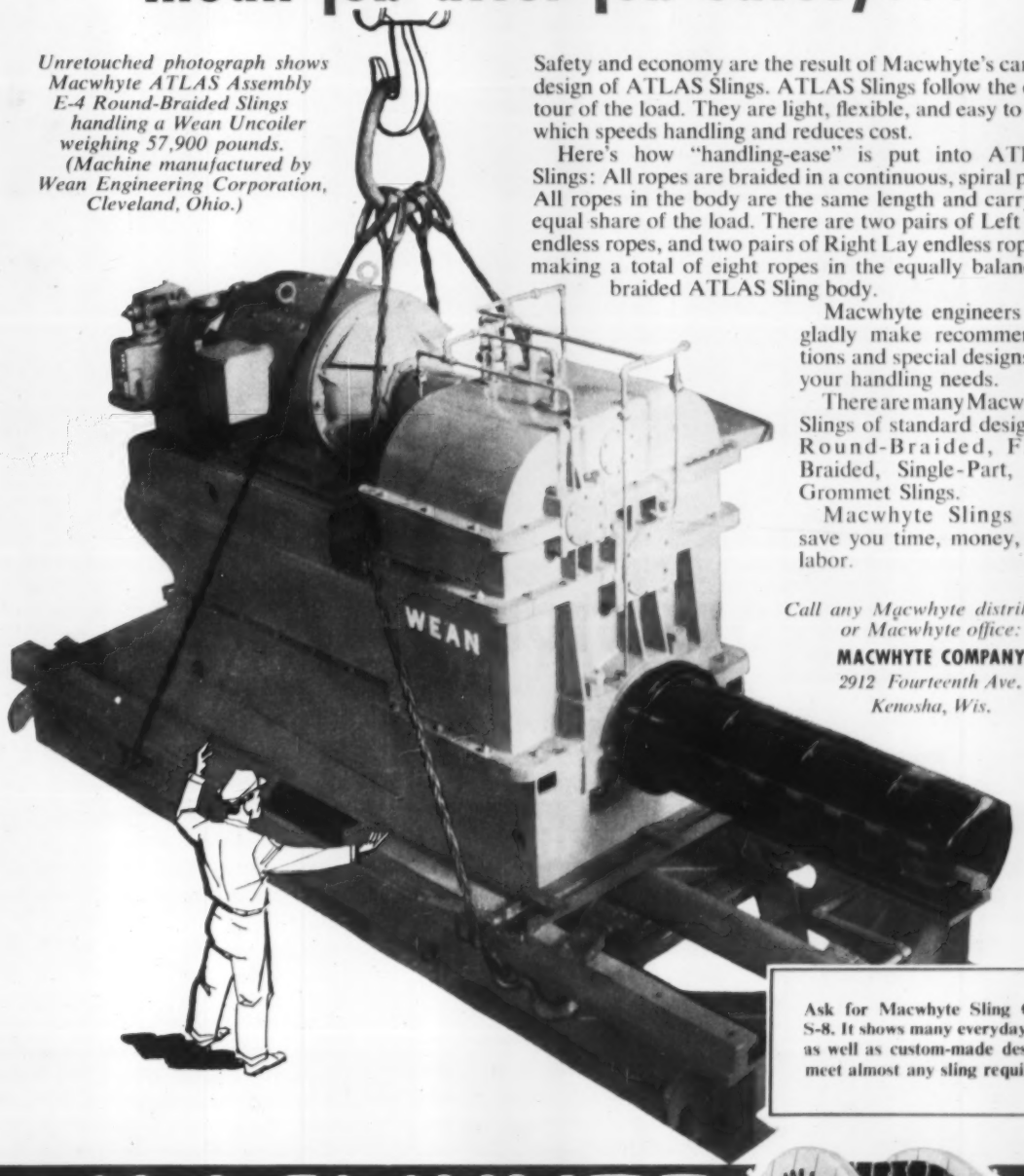
SKF INDUSTRIES, INC., PHILADELPHIA 32, PA., *manufacturers of* **SKF** *and* HESS-BRIGHT® *bearings.*

SKF®

BALL AND ROLLER BEARINGS

Flexible, lightweight ATLAS Slings mean job-after-job safety...

Unretouched photograph shows Macwhyte ATLAS Assembly E-4 Round-Braided Slings handling a Wean Uncoiler weighing 57,900 pounds. (Machine manufactured by Wean Engineering Corporation, Cleveland, Ohio.)



Safety and economy are the result of Macwhyte's careful design of ATLAS Slings. ATLAS Slings follow the contour of the load. They are light, flexible, and easy to use, which speeds handling and reduces cost.

Here's how "handling-ease" is put into ATLAS Slings: All ropes are braided in a continuous, spiral path. All ropes in the body are the same length and carry an equal share of the load. There are two pairs of Left Lay endless ropes, and two pairs of Right Lay endless ropes—making a total of eight ropes in the equally balanced-braided ATLAS Sling body.

Macwhyte engineers will gladly make recommendations and special designs for your handling needs.

There are many Macwhyte Slings of standard design in Round-Braided, Flat-Braided, Single-Part, and Grommet Slings.

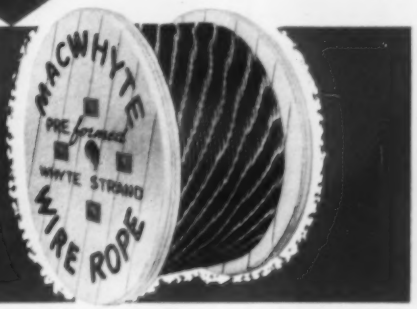
Macwhyte Slings can save you time, money, and labor.

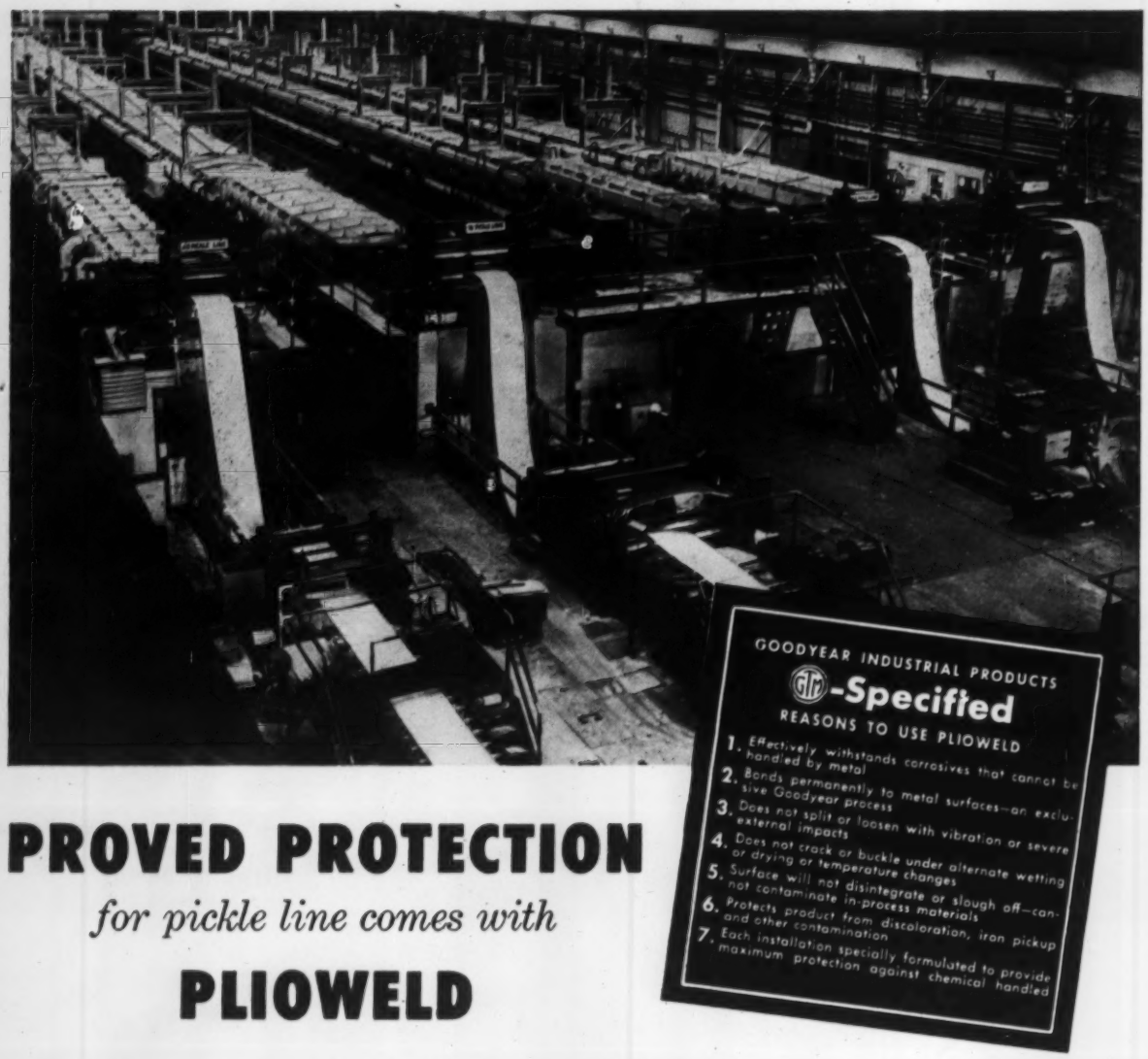
Call any Macwhyte distributor, or Macwhyte office:

MACWHYTE COMPANY
2912 Fourteenth Ave.
Kenosha, Wis.

Ask for Macwhyte Sling Catalog S-8. It shows many everyday slings, as well as custom-made designs to meet almost any sling requirement.

MACWHYTE
WIRE ROPE · SLINGS · WIRE ROPE ASSEMBLIES

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GTM-Specified
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1. Effectively withstands corrosives that cannot be handled by metal
2. Bonds permanently to metal surfaces—an exclusive Goodyear process
3. Does not split or loosen with vibration or severe external impacts
4. Does not crack or buckle under alternate wetting or drying or temperature changes
5. Surface will not disintegrate or slough off—cannot contaminate in-process materials
6. Protects product from discoloration, iron pickup and other contamination
7. Each installation specially formulated to provide maximum protection against chemical handled

PROVED PROTECTION

for pickle line comes with

PLIOWELD

Acid tanks. Hot and cold water tanks. Tank covers. Piping. Drip pans. Fume ducts. Fume scrubbers. Exhaust fans. Stacks and breeching. These are the points in a pickling line that can be thoroughly protected against chemical attack with rubber bonded to metal—with PLIOWELD.

Secrets of the proved success of PLIOWELD in combating corrosion—and abrasion—are its availability in a range of compounds to meet specific needs and its permanent bond to metal. PLIOWELD does many jobs well and once on the job, it stays there.

Whether your problem is handling acids or alkalies, salts, alcohols, fumes, water or abrasive slurries, the G.T.M.—Goodyear Technical Man—can show you how to improve production and lower costs with PLIOWELD linings and coverings. He also can give you interesting information on rubber covered rolls. For details, see the G.T.M. or write: Goodyear, Industrial Products Division, Akron 16, Ohio

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

GOODYEAR

THE GREATEST NAME IN RUBBER

Pliowold—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

STEEL
The Metalworking Weekly

JUNE 13, 1955
Vol. 136 No. 24

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behind the scenes

Tool Show Tuneup

The word Chicago is a phonetic assault on an Indian expression meaning wild onions. This startling bit of information has no value at all, and we threw it in only as an extra service to those of our readers who might be Sacs or Foxes, an association of early settlers in wild onions.

Speaking of early settlers in Chicago—and you must admit we finally got around to it the hard way—another association of early settlers

met in Chicago last month; it was the National Machine Tool Builders' Association, and they met at the Edgewater Beach hotel early in the season to settle problems concerning their September Machine Tool Show.

The Show Committee staged an unusual presentation pointing up its "Greatest Show on Earth," and Committee Chairman W. E. Rutz, Giddings & Lewis Machine Tool Co., was kind enough to send us a photograph of the presentation. Our editors were delighted to observe that two of the slogans "Who Decides Machine Tool Purchases?" and "56 Per Cent Machine Tools . . . " were lifted from STEEL.

Gum Beating Department

As you may have guessed, we're paid to beat the drum for STEEL, but it isn't difficult to make like an extrovert when evidences continue to pile up, suggesting that this magazine is highly respected and thoughtfully regarded by competent critics. We aren't modest at all, like Clement Attlee, for example. Winston Churchill once remarked: "Clement Attlee is a very modest man, as he has every right to be."

Well, we have no right to be modest, particularly when we just learned that the *National Sales Executive Digest* reprinted an excerpt from an article appearing on page 91 of the Feb. 22, 1954, issue of STEEL. The article was "How To Forecast Sales."

While we're quoting, we may as well add that the *New Yorker*, May 14, 1955, picked up a short item from STEEL's "Mirrors of Motordom" page and made a light comment on it. Frankly, we were rather surprised to hear that STEEL had caught the astonished attention of the *New Yorker*. There's nothing unusual about it, of course; it just sort of suggests Rita Hayworth curling up with a copy of advanced calculus.

Impatient Patient

When Managing Editor Walt Campbell interviewed Dave Reynolds (Management at Work, page 75) in a Louisville hospital, Dave was in traction by reason of a slipped disc. The Reynolds enthusiasm was so great, however, the harness threatened to give. "If I can place 60 million aluminum wastebaskets in 60 million homes," he declared, "I'll get rid of 60 million lb of aluminum. Let me out of here! I just uncovered another market!" He even plans to make Burma Shave signs out of aluminum, which prompted Campbell to muse:

Tin signmakers, friend, have some gloom in 'em
'Cause Reynolds, it seemeth, is doomin' 'em;
Soon they'll print all the lines
Of the Burma Shave signs
Not on tin, but on Reynolds' aluminum!

Try Angles

Robert Abbot, director of metallurgy, White Motor Co., called in the answer to the Pascagoula puzzle: 83161. We have a stinker for next week, but because we haven't room for it now, try this one: How many triangles will be formed if every vertex of a regular octagon is connected with every other?

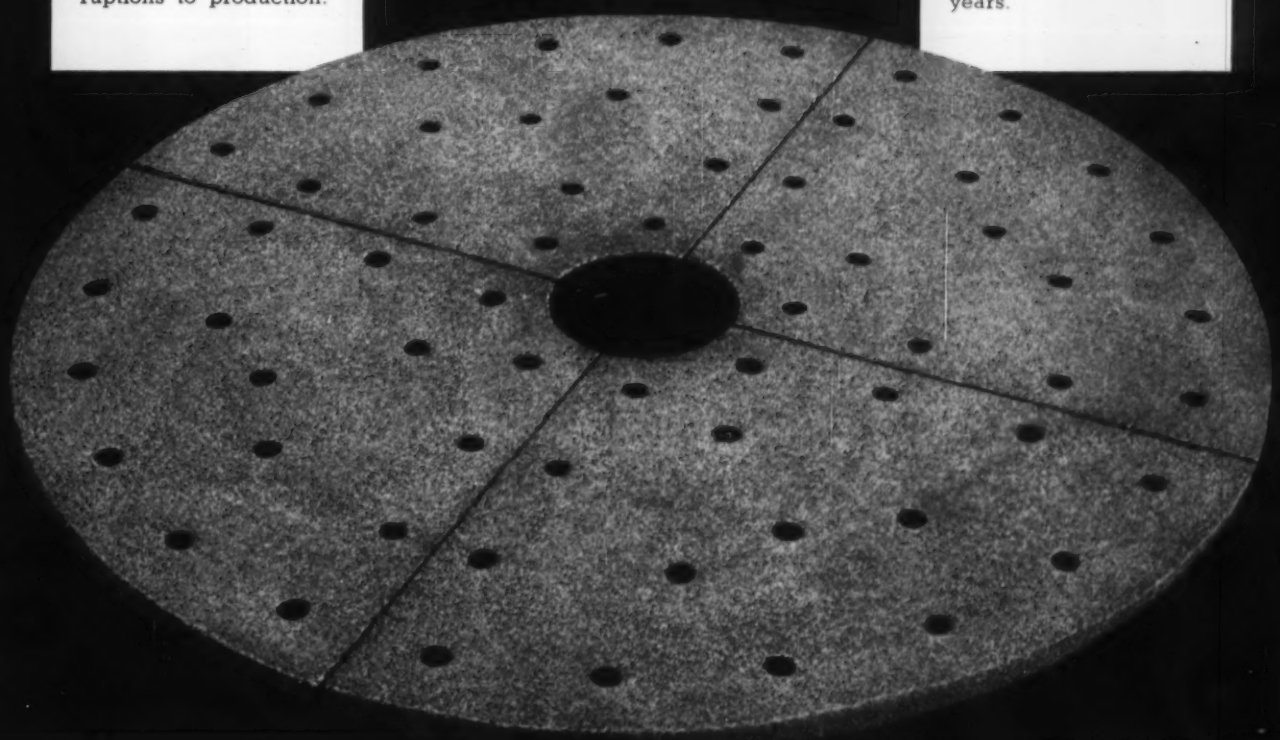
Shrdlu

(Metalworking Outlook—Page 59

HOW A HARDER GRADE ABRASIVE INCREASED DISC LIFE 10 TIMES

The Problem
An ordinary type of segmental disc had to be replaced after snag grinding only 51,000 automobile cylinder blocks on a Gardner Horizontal Disc Grinder. The short disc life caused high abrasive costs and interruptions to production.

The Solution
The Gardner Abrasive Specialist recommended a YELLOW-RIM segmental disc of a much harder grade. This new disc has already ground more than 250,000 cylinder blocks and is expected to grind 250,000 more in the next two years.



If you encounter problems in flat surface grinding Gardner Abrasive Specialists can help you solve them. They have experience gained from making both the grinding machines and the abrasive discs.

For help with *your* grinding problems, consult the Gardner Abrasive Man.

GARDNER

abrasive discs

BELOIT WISCONSIN

The man who needs a new machine tool and doesn't buy it is paying for it anyway...

in hidden tooling costs

THE difference between your costs and your competitors' may be hidden behind the production line. It's the cost of maintaining your tooling.

There's time lost for tool sharpening! Extra floor space for extra machines in the tool room! Skilled tool dressers! Chuck alignment and maintenance! Production lost for wheel dressing!

One answer to hidden tooling costs is Microhoning

Instead of bits to be sharpened and wheels to be dressed Microhoning uses self-aligning, self-dressing tools. Throughout their life Microhone abrasives make clean, uniform cuts.

Look behind the production line and you'll find that your hidden tooling expense may total more than the cost of the latest type of Microhoning equipment, which would assure you of increased output, uniform quality, consistent accuracy of dimension and a functional surface finish. In short, you are paying right now for the new machine tools you don't have.

Surface: Spline in gear
Condition: Distorted by heat-treating

PROBLEM:

Excessive tooling cost—frequent changing and sharpening of tools—annealing of surface required—poor surface finish.

SOLUTION:

MICROHONING—Tool self sharpening—annealing not necessary—clean, consistent surface finish generated.

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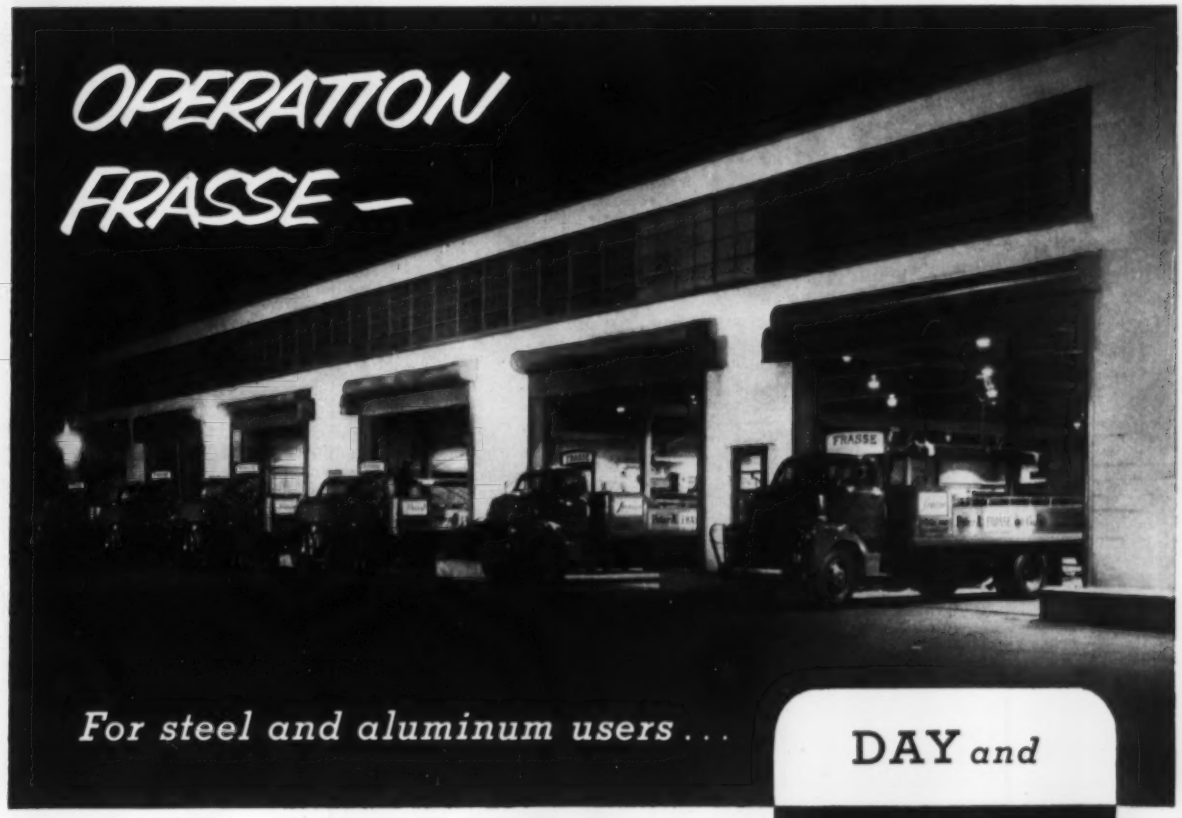
MICRO-PRECISION DIVISION • 2205 Lee Street, Evanston, Illinois
Hydraulic controls • Diesel fuel injection equipment

Visit Booth 1211 at the Show. See demonstrated why there are no hidden tooling costs with Microhoning.



While you sleep, loading operations are underway . . . before you awaken modern Frasse trucks are rolling with material you ordered hours ago.

This fast, on-the-ball delivery is typical of the handling your orders receive when you do business with Frasse. Thousands of firms know this service is *routine* . . . and depend on quick, sure delivery from Frasse to keep production lines producing.

Frasse stocks *all* of the popular grades, shapes and sizes of stainless, alloy and carbon steels, tubing and aluminum . . . plus many specials, too. When you work from complete Frasse warehouse stocks you eliminate needless "shopping".

And, remember — Frasse engineers are always available to consult with you on problems involving steels, tubing and aluminum. Their services are free, and they can be consulted anytime — by mail, phone . . . or on the spot in your plant.

It's
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for complete warehouse service

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LETTERS
TO THE EDITORS

New Record?

The articles in your 1955 Program for Management series indicate they may eclipse the 1954 series. May I have copies of Parts 1 and 2 of this year's articles? I should like to maintain a separate file without cutting into the magazine.

George T. Raffensperger Jr.
National Radiator Co.
Middletown, Pa.

We are interested in this series and will appreciate one copy of those produced to date. It is our intention to go over them with the idea of possibly obtaining an additional supply for circulation to our management people.

R. A. Bateman
Manager, Public Relations
Kaiser Engineers
Oakland, Calif.

Figures Are Lacking

We need production figures over the last 10 years for turned and polished round bars. Do you know of any data?

John B. Sutton Jr.
President
Sutton Engineering Co.
Bellefonte, Pa.

• *We know of no such statistics. The American Iron & Steel Institute shows production figures for cold-finished bars, but it neither gives a breakdown on turned and polished bars nor does it differentiate the various shapes of bars.*

Definition of Capacity

The interpretation of your National Steelworks Operations graph in the Market Outlook section generally has two different meanings for the people I have talked to in the steel business here in Los Angeles.

Some of us believe 100 per cent of capacity refers to the 1947-1949 period where capacity was approximately 100-million tons. Others believe that 100 per cent of capacity equals the total rated capacity, approximately 125 million tons per year.

Extensions of the week's capacity figures in the Ingot Production box show a capacity of slightly over 125-million tons per year.

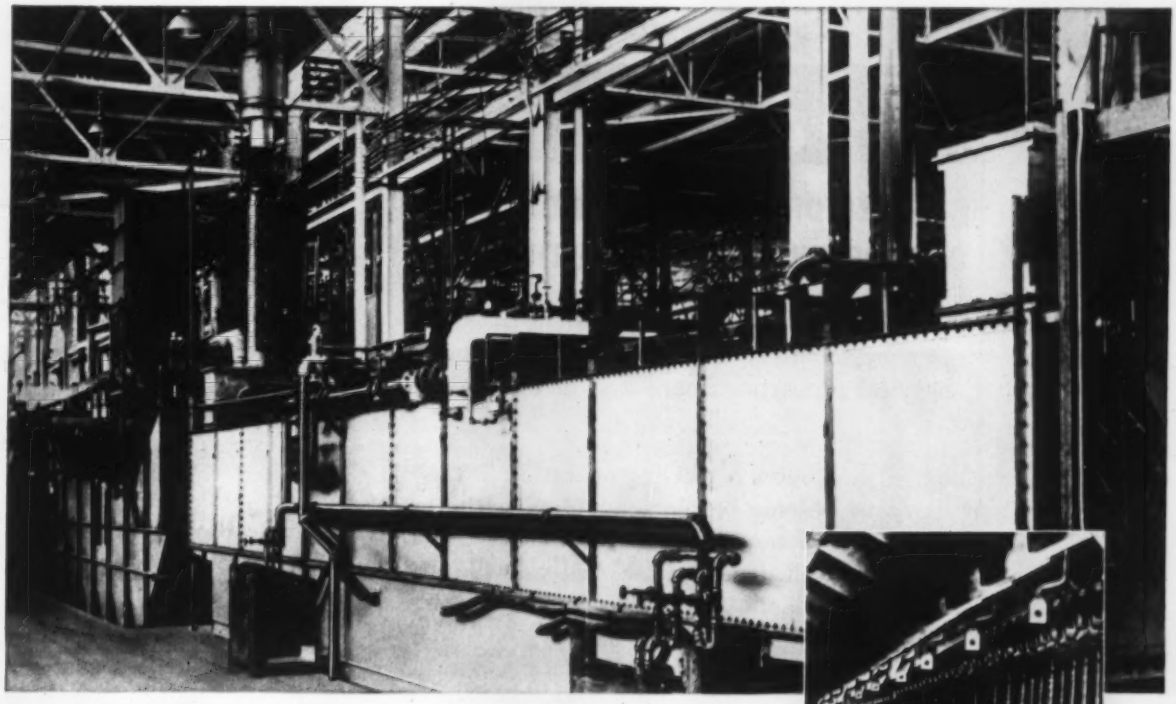
Can you straighten me out on this situation so I can properly interpret the figures in the Ingot Production information in relation to the National Steelworks Operations graph?

J. F. Van Dam
Division Production Manager
Peerless Pump Division
Food Machinery & Chemical Corp.
Los Angeles

• *The steelworks operations percentages —referring both to the graph and the rates—are based on the latest capacity figures which were issued by the Am-*

(Please turn to page 12)

Sulphuric acid tamed... when it flows through low-cost U. S. Rubber Linings and Pipe



Sulphuric acid has been known to eat the bottom right out of production economies. But this large Midwestern plant is one of many that has found the economic way of handling this highly corrosive acid. They use United States Rubber Company Linings and Uscolite® plastic pipe and fittings.

The pickling machine in this plant handles a 10% to 15% solution of sulphuric acid. The process tank, pipe and pipe headers, and internal surfaces of housings and plates are lined with U. S. Permobond®. Pipe, street ells and nozzles are made of U. S. Uscolite, the thermoplastic that resists corrosive acids.

Both Permobond and Uscolite are extremely versatile. Permobond can be bonded or applied to any fabricated metal section, no matter how big or complex. Uscolite piping is amazingly strong, yet lightweight and easy to handle. Both of these "U. S." products provide savings not only in operating costs, but in maintenance as well. Call on any of the 27 "U. S." District Sales Offices, or write to address below.

"U.S." Research perfects it . . . "U.S." Production builds it . . . U.S. Industry depends on it.

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Try for yourself!

AND SEE THE SUPERIOR WORKING PROPERTIES OF *Atlas* CORROSION-PROOF CEMENTS

Corrosion resistance of Atlas cements is only part of the story . . . Superior workability, containability, adhesion and many other important physical properties insure ease of installation and long term service.

We are offering anyone employing a pickling operation in their plant the opportunity to become better acquainted with the physical qualities of Atlas cements. Send us a card or letter telling us the type pickling solutions you use, and we will send you a small working sample of the Atlas cement most suitable for use in your tanks.

Then we ask you to mix it, trowel it unto brick and lay it aside until the next day. You will see the ease in mixing, absence of objectionable odors, containability, ease of application, lack of shrinkage and superior adhesion.

Send for a working sample of Atlas Corrosion Proof Cements and see why we feel secure in saying, "Atlas Corrosion Proof Cements are the first step toward a tough, durable pickling installation."

ATLAS MINERAL PRODUCTS COMPANY

MERTZTOWN, PENNSYLVANIA

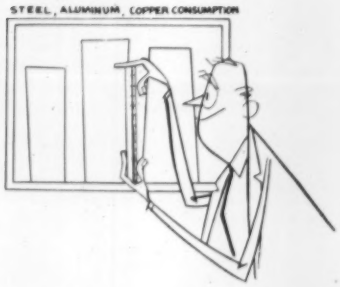
LETTERS

(Concluded from page 10)

erican Iron & Steel Institute. Percentages currently are based on Jan. 1, 1955, capacity figures of 125,828,310 net tons per year (100 per cent) or 2,413,278 tons per week (dividing the year into 52.14 weekly periods). The 1954 figures: 124,330,410 net tons per year (100 per cent) or 2,384,549 tons per week.

The index used in the Ingot Production box is based on the average weekly production of the three-year period, 1947-1948-1949.

Trend Measurer



Thanks for the data on inventory changes in steel, copper, and particularly aluminum. This information is important in attempting to measure trends in consumption.

S. M. Blumenreich
Economic Analyst
General Sales Office
Reynolds Metals Co.
Louisville

Adaptable Newcomer

We noticed an item, "Nylon Branches Out," in the Technical Outlook department of Apr. 18 (page 103). It discusses the use of caprolactam-type nylon in new industrial fields, especially in conveyor belts. May we have the name and address of its manufacturer?

R. J. Molloy
Manager, Research Division
Heckethorn Mfg. & Supply Co.
Denver

• *Write to Harry Voskamp, sales manager, Thermoplastic Resins, Barrett Division, Allied Chemical & Dye Corp., 61 Broadway, New York, N. Y. The company's name for the material: Plaskon Nylon 8200.*

Communication Problem

I have the fortune (I do not know whether it is good or mis-) to be chairman of our management committee, and your article, "Business Communication: Put It on Executive-Saving Time" (May 16, page 103), is timely. I want to study the problem more. Do you know to whom I can write for literature?

A year ago I was unfamiliar with your magazine, but now it is one of the few technical publications I find of value. My copy is read immediately upon receipt and then circulated to other persons in our metallurgical department.

Vincent Ayres
Chief Engineer, Saginaw Division
Eaton Mfg. Co.
Detroit

• *Write the American Management Association, 330 W. 42nd St., New York 18, N. Y. It has a library of the better books and articles on the subject and doubtlessly would be happy to send a reference list.*

Industrial JIB CRANES

Head Assembly jig-welded for perfect alignment of entire jib.

Head Assembly pivots on heavy ball thrust bearing at top of column.

Head Assembly equipped with 4 large rollers, each containing 2 precision ball bearings. Rollers engage the surface of the vertical column.

All welded steel construction.

Special designs for larger capacities.

Jib girder made of high carbon steel.

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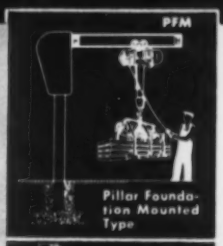
Spans to 14 feet in capacities to 12,000 lbs.

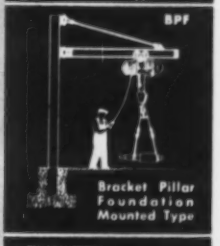
Pillar made of heavy seamless steel pipe.

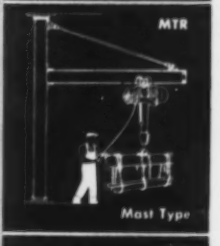
Jib rotates in a complete circle in either direction.

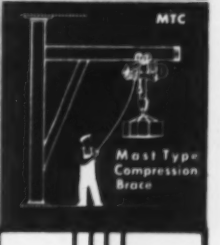
Jib Crane is completely self-supporting.

Complete electrification available.









Industrial PBM Jib Cranes are ruggedly built for heavy duty service. Swinging in a complete circle these smooth operating cranes can efficiently serve several machines; freeing the heavy overhead cranes for many other important duties. Study the features of the Industrial PBM — the outstanding Jib Crane in Industry.

Industrial manufactures 6 other types of Jib and many models of Overhead Traveling Cranes to cover every need. Consult with Industrial for cranes to solve your material handling problems.

Industrial CRANES

INDUSTRIAL CRANE & HOIST CORPORATION

6 Cost Cutting Ideas with Modern Landis Plain Grinders

Landis tooling combines grinding operations . . . cuts cost per finished piece

10" x 18" Landis Type CH Plain Hydraulic Grinder

Booth 1117

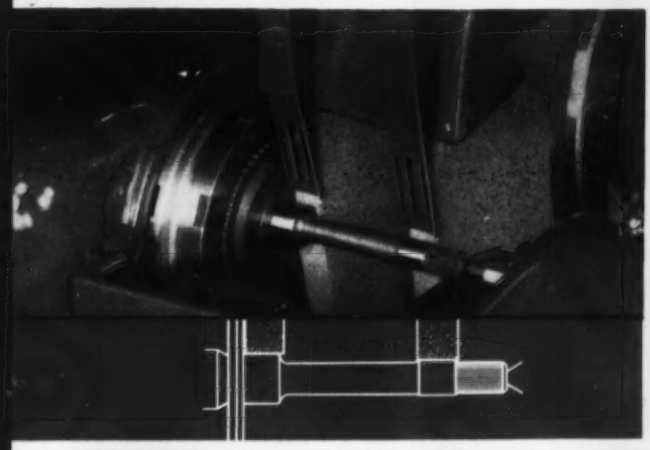
THE MACHINE TOOL SHOW

MTS

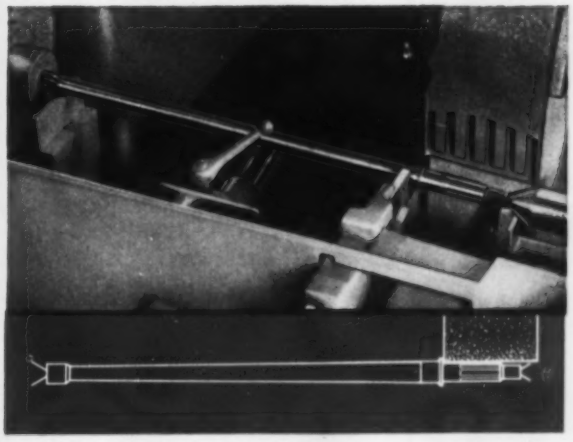
These are typical examples showing why cost conscious production men depend on modern Landis Grinders to lower cost per finished piece. Send prints of your work pieces for production and tooling estimates. Landis Tool Company, Waynesboro, Pennsylvania.

LANDIS

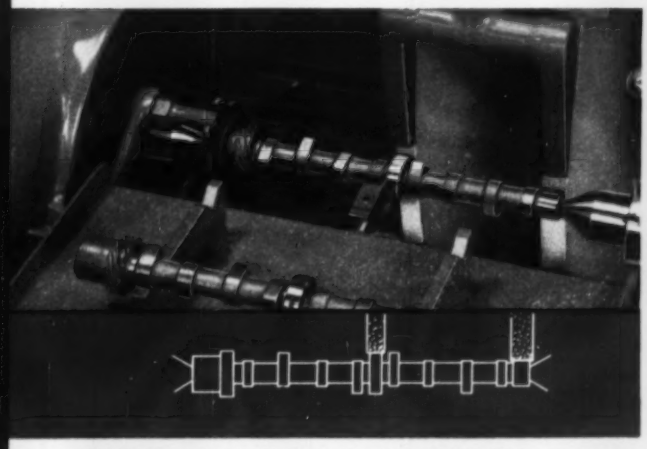
precision grinders



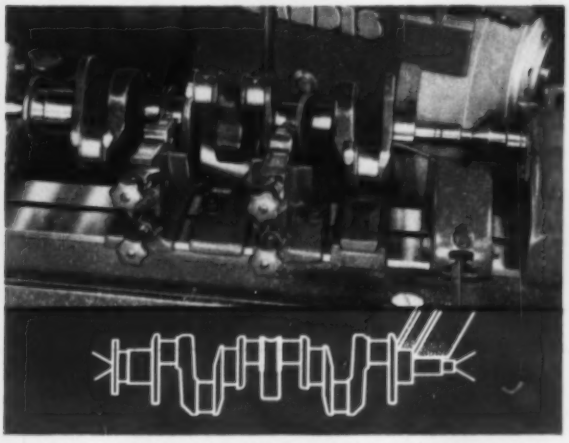
TWO DIAMETERS GROUND IN ONE OPERATION—by straight infeed with spaced wheels.



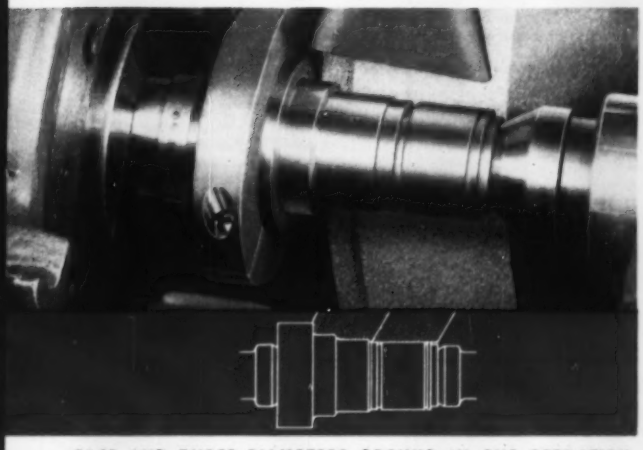
GRINDING DIAMETER AND ADJOINING RADIUS—in first operation. Second operation grinds adjoining diameter.



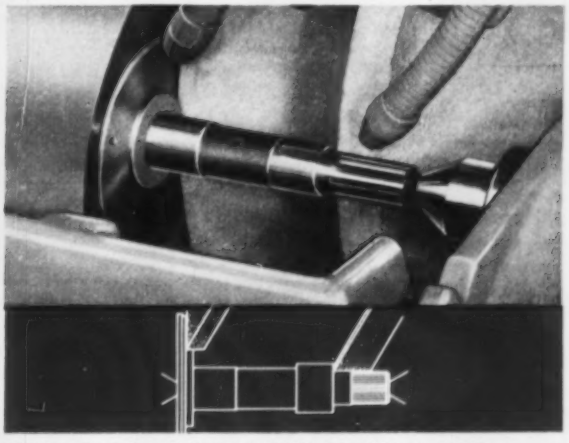
GRINDING TWO DIAMETERS IN ONE OPERATION—Straight infeed grinding with spaced wheels.



GRINDING END DIAMETERS AND FACE OF CRANKSHAFT—in one operation using spaced wheels on wheelbase set at 30° angle.



FACE AND THREE DIAMETERS GROUND IN ONE OPERATION—using a wide wheel, profile dressed and wheelbase set at 30°.



GRINDING TWO DIAMETERS WITH ADJOINING FACES—in one operation. Wheelbase set at 30°. Straight infeed grinding.

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That's how a rivet fastens — and that's what Milford service is—from 5 Milford plants and 19 Milford offices. Try us and see for yourself — soon!

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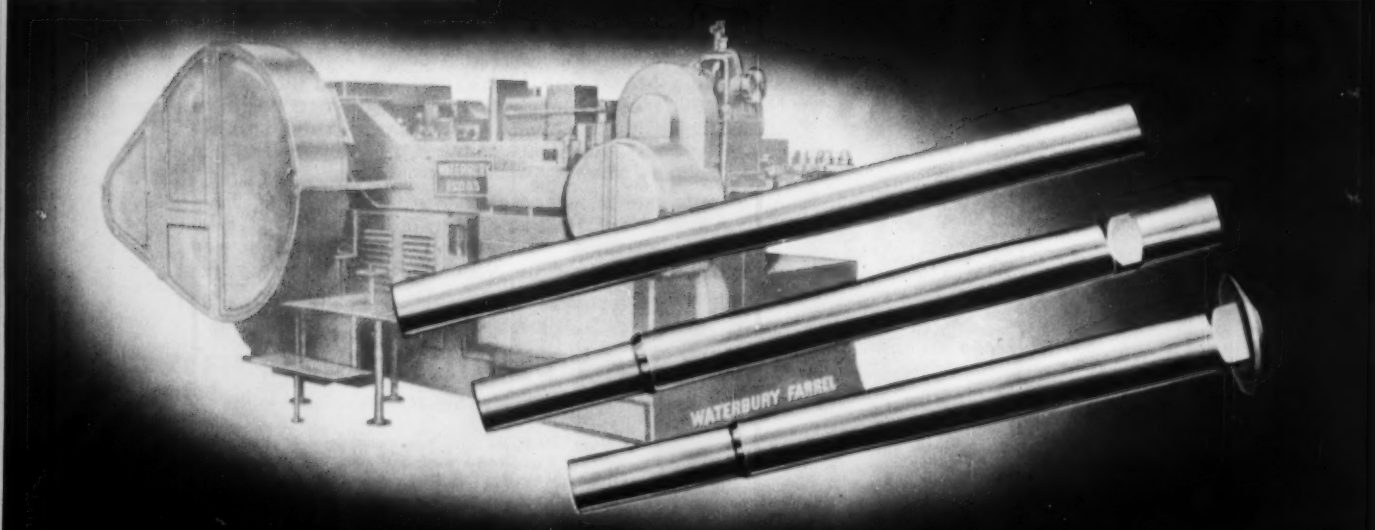
P.O. Box 2119, WATERBURY, CONN.
PLaza 6-8121

Unbalanced yarn spinning at 10,000 rpm imposes tremendous stresses on this textile spindle made by H. H. Arnold Co., Rockland, Mass. So Arnold uses Hawkridge Tri-Met to insure long life and trouble-free performance.

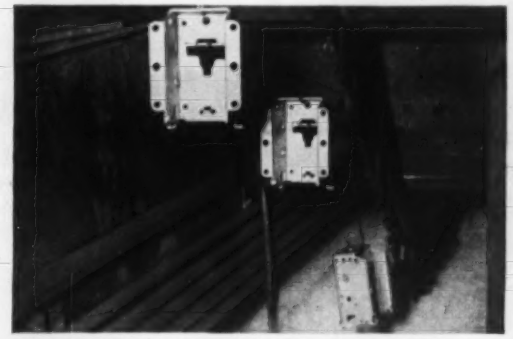
To insure its supply of cold rolled strip for its Craig Projecto Editor, The Kalart Co., Inc., Plainville, Conn., depends on Hawkridge as a source to absorb seasonal demand peaks.



Hardy header dies made from specially heat treated die steel supplied by Hawkridge are the heart of this Solid Die Double Stroke Header made by The Waterbury Farrel Foundry and Machine Company.

FOR DEGREASING, DESCALING AND ELECTROPLATING

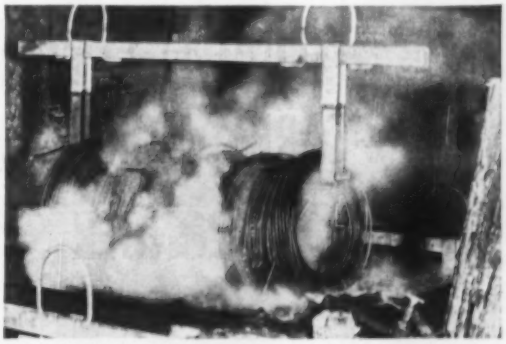
Depend on these Du Pont products and processes



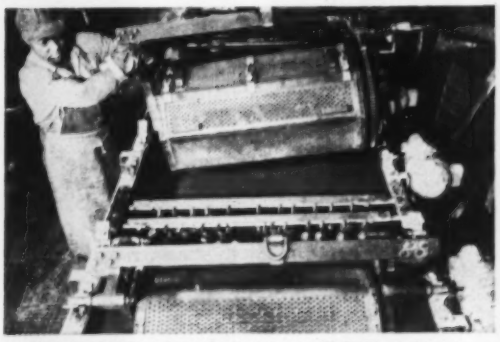
BRIGHT, CLEAN, DRY parts coming from the vapor degreaser after being quickly, economically cleaned with Du Pont TRICLENE D.

FOR VAPOR DEGREASING: You get bright, thorough cleaning for any class work . . . in any vapor degreaser with TRICLENE® D trichlorethylene. An exclusive Du Pont formulation gives it rugged resistance to *all* the major causes of solvent deterioration . . . yet TRICLENE D cleans safely even the most delicate metal surfaces. This means a higher standard of vapor degreasing and reduced maintenance cost . . . at no extra cost to you!

FOR DESCALING: With the Du Pont-pioneered Sodium Hydride Process you can thoroughly descale any metal unaffected by fused caustic at 700° C—*within 20 minutes or less.* And because bath action stops the instant scale is reduced, there's no loss of base metal . . . no pitting or etching to cause costly rejects. Scale-breaking operations, necessary with older descaling methods, are eliminated entirely, and the process is so easy to operate that any pickler can be trained to run it within hours.



AFTER SODIUM HYDRIDE TREATMENT, reduced scale on carbon steel wire is blasted off with a water quench.



BARREL PLATING with Du Pont ZIN-O-LYTE. Brilliant deposits are obtained directly on parts of all sizes and shapes.

FOR ELECTROPLATING: You can depend on Du Pont plating chemicals and processes for economy and high-quality results—in barrel, still, semi- or fully automatic equipment.

For Zinc Plating: ZIN-O-LYTE® plating salts and chemicals; DUROBRITE® Addition Agent 309.

For Cadmium Plating: CADALYTE® plating salts and chemicals.

For Copper Plating: COPPRALYTE® plating salts.

For Copper and Silver Plating: Sodium Cyanide and Potassium Cyanide.

For more information on any of these products or processes write to E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware, or call the Du Pont office nearest you.

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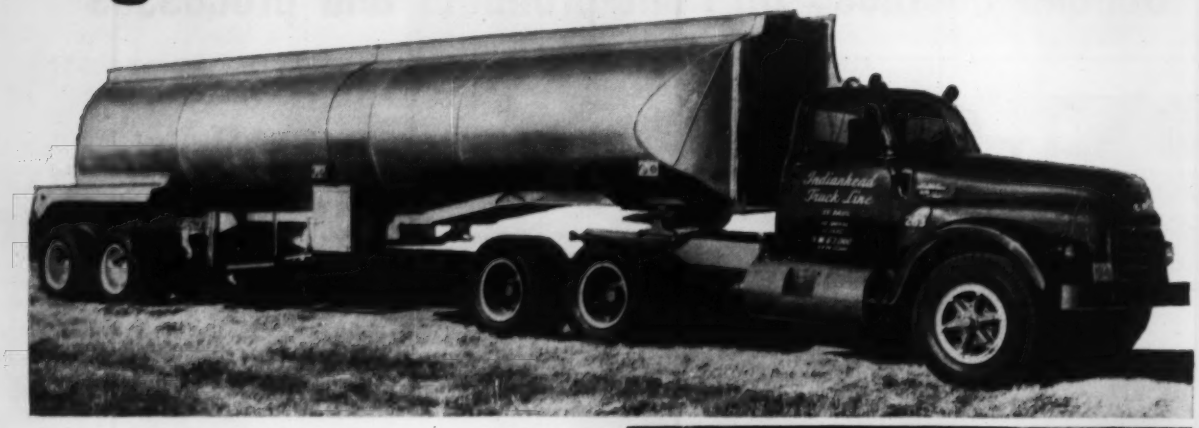
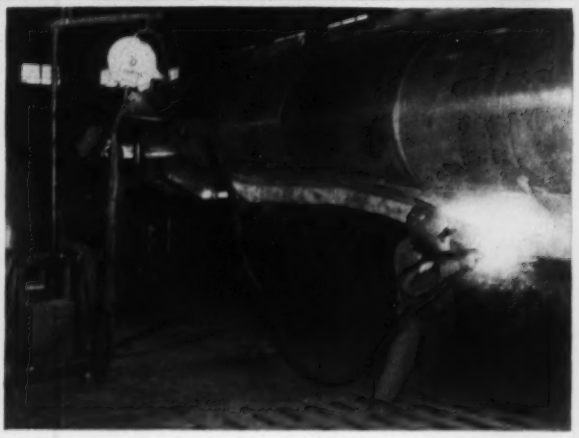
Sigma Welded Aluminum Tanks



—WEIGH LESS
—CARRY MORE
—LAST LONGER



The problem of how to get bigger pay-loads in truck trailers and semi-trailers was solved by one manufacturer who converted to weight-saving aluminum and sigma welding . . . These giant semi-trailer tanks hold 7,950 gal.—700 gal. more than similar tanks made of steel.

The high quality of sigma welded aluminum has increased tank resistance to corrosion. Sigma welding has also eliminated expensive weld cleaning—welds need only a light grinding and they are finished. Each semi-trailer requires about 1,100 linear ft. of sound sigma welding. The new high-strength, ductile alloys used range in thickness from 3/32 to ½ inch.

Like many other products throughout industry, these trailers are being fabricated with new quality and efficiency using sigma welding.

Here are some features of sigma welding—

- Uses any d.c. or constant potential power supply. With c.p. voltage is held constant—welding operations are fast and more efficient.
- Makes smooth welds in joints of all types—on all commercially welded metals . . . joins metals up to ¼ in. thick in one pass.
- Sigma welding speeds exceed 100 in. per min. in many operations. Start saving now, call your local LINDE representative for more information—and ask for Form 7942 "Modern Methods of Joining Metals."

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by strong, sturdy JOHNSTON CINDER POTS—
looking for opportunities to cut
slag-handling costs.

SPECIAL QUALIFICATIONS—Corrugated walls to increase radiating surface and cooling speed • curved sidewalls to prevent cracking and inward creep • bottom support brackets to relieve strain at critical sections • expansible rims to resist distortion.

FAMILY HISTORY—in actual use for over a quarter of a century with a reputation for constant efficiency, economical upkeep and long life.

BEST REFERENCES—from most of today's prominent plants in the ferrous and non-ferrous industries. Prefer being placed side by side with other cinder pots in your slag train for comparison of performance and service. Will operate effectively 24 hours a day on any slag train at blast furnace, open hearth or electric furnace. Available for immediate duty.

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MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners . . . electronically controlled contouring lathes . . . screw feed roll turning lathes . . . heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills.

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'til tomorrow for Screw Machine Reamers when MORSE can ship them TODAY?

That's right! Morse is set up to give you immediate delivery on Stub Screw Machine Reamers in any size ranging from .060" through 1". This is typical of the many services that your Morse Franchised Distributor can offer you on all your cutting tool needs. He's the only man that can offer you the many Morse exclusives including Electrolized tools and Vectormatic ground taps.

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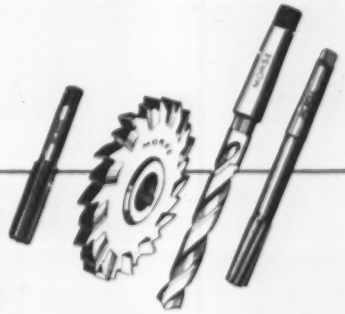
THE MORSE CODE MEANS 100% DISTRIBUTOR PROTECTION . . . **on all**



MORSE
Cutting Tools

World's tallest pile driver...

World's toughest test rig...

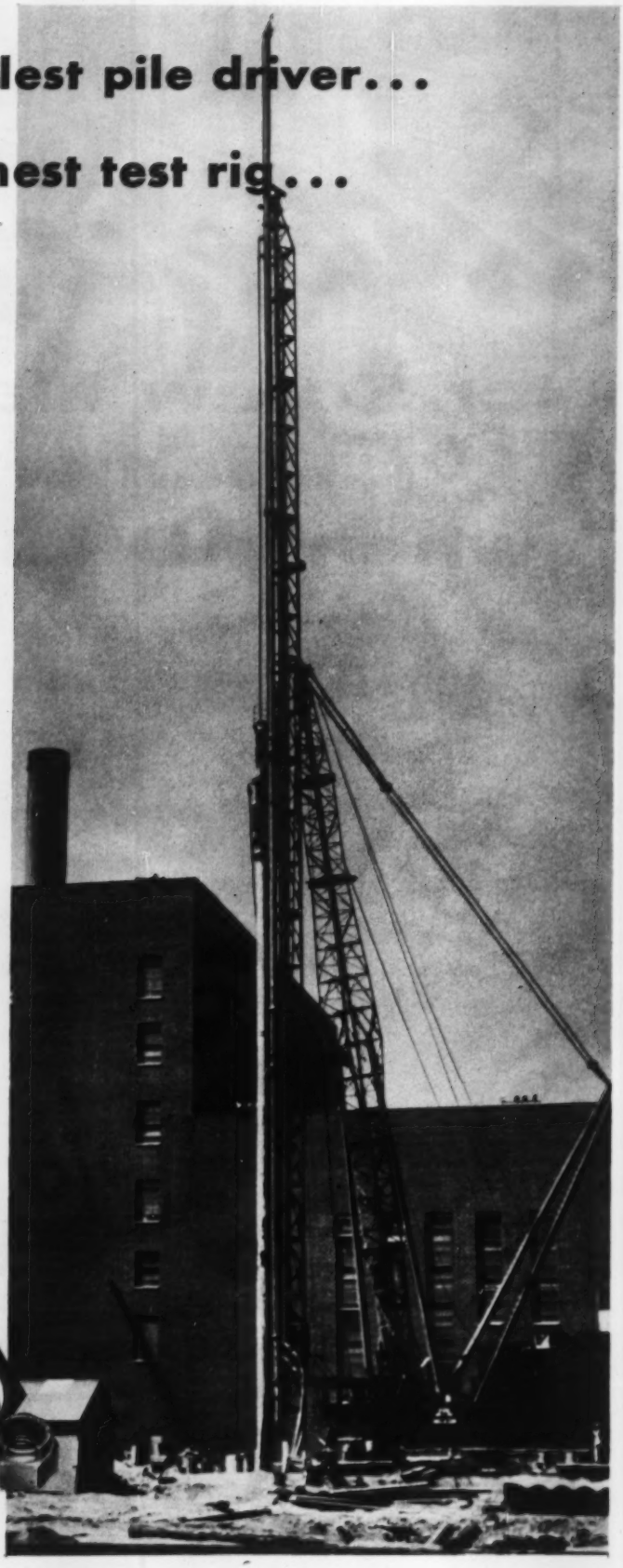
for

Elastic Stop® nuts

Each hammer-stroke of this 270-foot pile driver delivers a 24-foot-ton wallop! It was built by Raymond Concrete Pile Company to drive 200-foot pipe piles for the foundation of units being added to the B. C. Cobb Steam Plant of Consumers Power Company, at Muskegon, Mich.

Raymond makes a practice of using Elastic Stop® nuts for bolting together sections of leads and booms on all their pile-driving equipment. The red elastic locking collar of these vibration-proof fasteners has successfully maintained its grip under these severest of all vibration and impact conditions!

Whether used on aircraft or locomotives; guided missiles or steam shovels . . . more than twenty years of field testing on applications where safety and severe operating conditions demand a fastener that will not shake loose, prove that . . . *you can rely on Elastic Stop nuts.*



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Department N77-660 • 2330 Vauxhall Road • Union, N. J.

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- reusability
- vibration-proof locking
- thread sealing . . . no galling
- immediate identification
- adaptability to all shapes and sizes of threaded fittings
- suitability to production line assembly methods

CALENDAR
OF MEETINGS

June 13-17, Technical Writers' Institute: Rensselaer Polytechnic Institute, Troy, N. Y. Information: Jay R. Gould, director, Technical Writers' Institute, Rensselaer Polytechnic Institute, Troy, N. Y.

June 13-17, American Society of Civil Engineers: Spring meeting, Jefferson hotel, St. Louis. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: Col. William N. Carey.

June 13-17, National Association of Power Engineers Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Association's address: 176 W. Adams St., Chicago, Ill. Secretary: A. F. Thompson.

June 14-16, Radio-Electronics-Television Manufacturers Association: Annual meeting, Palmer House, Chicago. Association's address: 777 14th St. N.W., Washington 5, D. C. Secretary: James D. Secrest.

June 14-16, American Institute of Electrical Engineers: Magnetics conference and exhibit, William Penn hotel, Pittsburgh. Institute's address: 36 W. 46th St., New York 36, N. Y. Secretary: N. S. Hibshman.

June 15-17, American Marketing Association: National conference, Schroeder hotel, Milwaukee. Association's address: David Kinley Hall, University of Illinois, Urbana, Ill. Secretary: Harvey W. Huegy.

June 15-17, American Society of Mechanical Engineers: International conference on combustion, Massachusetts Institute of Technology, Cambridge, Mass. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 15-17, American Society of Training Directors: Annual meeting and exhibit, Los Angeles. Society's address: 2020 University Ave., Madison 5, Wis. Secretary: Walter H. Kee.

June 16-17, Machinery & Allied Products Institute: Annual meeting, Hotel Statler, Washington. Institute's address: 1200 18th St. N.W., Washington 6, D. C. Secretary: Charles I. Derr.

June 16-18, American Society of Mechanical Engineers: National applied mechanics conference, Rensselaer Polytechnic Institute, Troy, N. Y. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 16-18, Malleable Founders' Society: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Managing director: Lowell D. Ryan.

June 18-23, Caster & Floor Truck Manufacturers Association: Summer meeting, abroad ship, en route to Bermuda. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: Harry P. Dolan.

June 19-22, Drop Forging Association: Annual meeting, Grove Park Inn, Asheville, N. C. Association's address: 605 Hanna Bldg., Cleveland 15, O. Secretary: Edgar L. Harden.

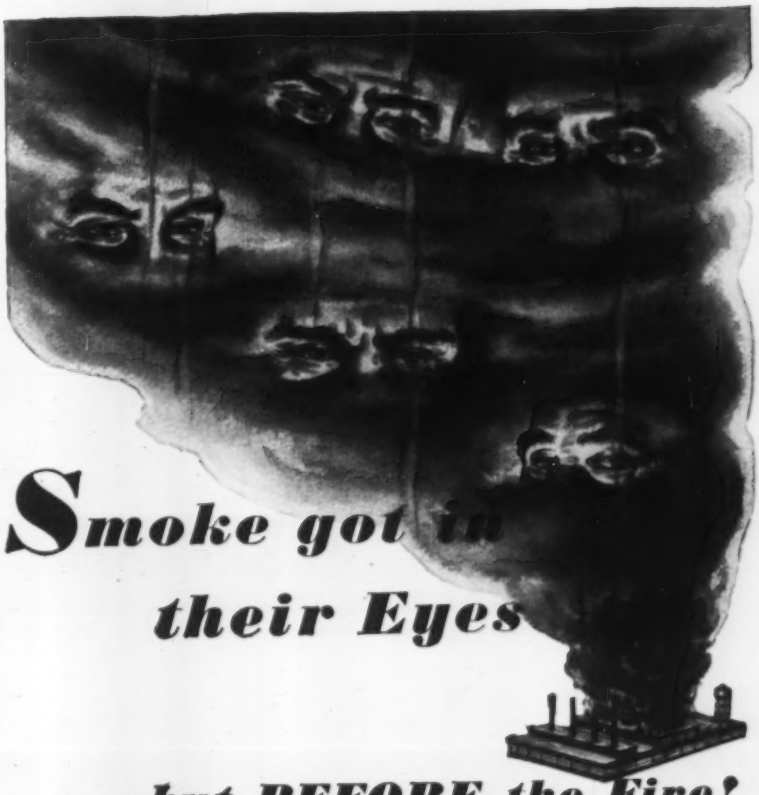
June 19-23, National Association of Cost Accountants: Annual meeting and exhibit, Waldorf-Astoria hotel, New York. Association's address: 505 Park Ave., New York 22, N. Y. Secretary: A. B. Gunnarson.

June 19-23, American Society of Mechanical Engineers: Semiannual meeting, Hotel Statler, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

June 20-23, American Electroplaters' Society: Annual meeting and exhibit, Public Auditorium, Cleveland. Society's address: 445 Broad St., Newark, N. J. Secretary: P. P. Kovatis.

June 23-26, American Coal Sales Association: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 1625 Eye St. N.W., Washington, D. C. Executive vice president: W. W. Bayfield.

June 26-28, Alloy Casting Institute: Annual meeting, the Homestead, Hot Springs, Va. Institute's address: 32 Third Ave., Mineola, N. Y. Executive vice president: E. A. Schoefer.



. . . but BEFORE the Fire!

Yes, the Men in Authority couldn't see the need—the *vital* need—for the *right* kind of fire protection. And fire struck, as always, when least expected—devastating fire that destroyed irreplaceable records, costly machines, buildings and supplies which will take months—months of no production—to build and replace.

Statistics prove that too many fires result from failure to be ready for them—particularly at key operation points where fire can hit like lightning, crippling operations—dealing a death blow to production!

Are *your* operations safe? A survey by Cardox will show you how CARDOX "Low Pressure Carbon Dioxide Systems"* can protect the danger spots in your plants against fire—eliminate fire extinguishment losses entirely. A few lines on your letterhead will bring full, eye-opening information.

*Covered by Patents Issued and Pending

CARDOX

ORIGINATOR OF **Low Pressure CO_2**

FIRE EXTINGUISHING SYSTEMS

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS

Offices in Principal Cities

Above: *Bed and Headstock are cast integrally to form an extremely heavy unit and to provide the rigid foundation for all types of work.*

Below: *Block type ways are straddle keyed to the bed and ground in perfect alignment with the spindle. All working surfaces are hardened to 64-66 Rockwell "C".*

ACCURACY THAT DOESN'T "WEAR OFF"

Here are two good reasons why you can count on the accuracy of Gisholt Turret Lathes—now and years from now.

One-piece bed and headstock, cast as a heavy, rigid unit, reduce distortion and vibration to a minimum. Headstock is jig-bored to insure—and maintain—perfect alignment of spindle and drive shafts, with ample metal to provide the most solid support possible.

Hardened steel ways are augmented by hardened steel strips secured to the ram saddle, as well as hardened steel gibs and clamps, making an assembly that is virtually wear-proof. Its accuracy is further preserved by force lubrication.

These advantages are yours for the long life of any Gisholt Turret Lathe. Ask for complete details.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

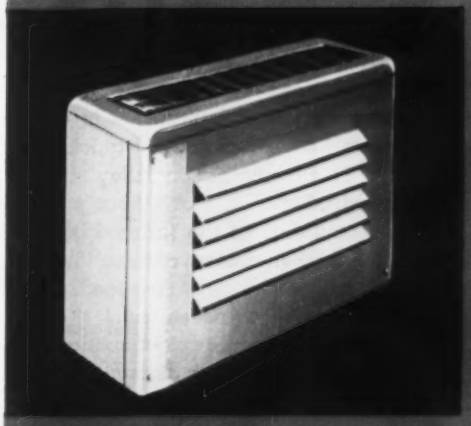
TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Why deep draws with

Weirzin

electrolytic zinc-coated sheets

provide important manufacturing economies



Because Weirzin has been proved to retain its amazingly uniform protective coating under extreme fabricating operations, it is specified by leading manufacturers for a wide variety of products.

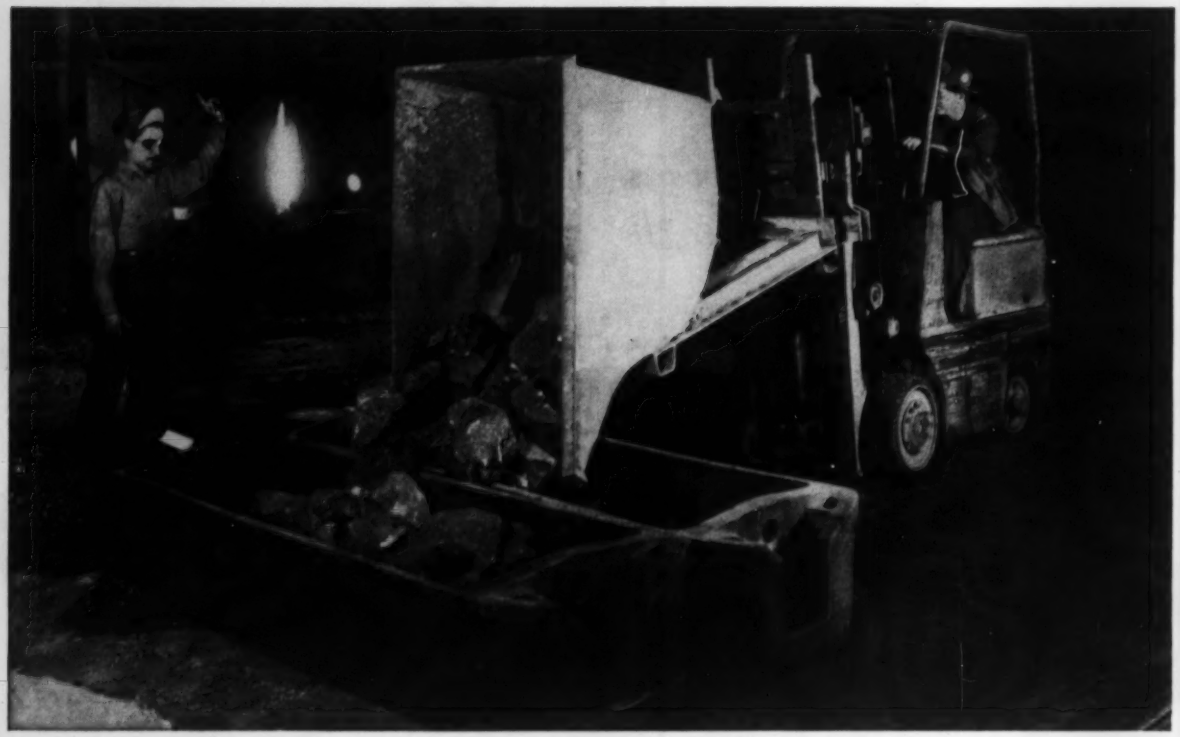
Drawing and forming are performed rapidly, with complete absence of flaking, cracking, or peeling. Inventory losses due to rust are materially reduced. Heat and moisture are successfully resisted. Absence of underfilm corrosion assures not only longer life, but also adherence of paint, lacquer, enamel and lithograph ink. And, for even longer adhesion, chemically treated Weirzin is available.

When the job calls for difficult deep draws, specify Weirzin and enjoy the double advantage of quality and economy.

WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION



Save furnace time with...
"ELECTROMET" SILICOMANGANESE

TRADE-MARK

ELECTROMET silicomanganese is an excellent deoxidizer for cleansing steel quickly and thoroughly. This combination alloy contains two active ingredients in the correct proportion for rapid deoxidation of the furnace bath. Because of the low carbon content of the alloy, the carbon in the bath need not be reduced so much as would otherwise be necessary.

This combination of rapid deoxidation and low carbon content can save as much as 20 minutes per melt in the production of open hearth steels. Furthermore, it provides close control of final analysis when blocking the heat. ELECTROMET silicomanganese is also well suited for additions to the ladle to adjust final specifications, particularly for engineering steels.

ELECTROMET silicomanganese contains 65 to 68 per cent manganese, and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades (containing 18 to 20 per cent, 15 to 17.50 per cent, and 12 to 14.50 per cent silicon, respectively). ELECTROMET's metallurgists, with years of practical experience in steel making, will be glad to help you with the use of silicomanganese, or any ELECTROMET products. Write or phone the nearest ELECTROMET office for further information or ask to have one of our metallurgists call. There is no cost or obligation for this service.

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

OFFICES: Birmingham • Chicago • Cleveland • Detroit
Houston • Los Angeles • New York • Pittsburgh • San Francisco

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Electromet

TRADE MARK

Ferro-Alloys and Metals

NOW...MORE WORK with HYDRATORK!

Clark Carloader sets new standards for the industry!

NEW! Increased engine power gives you faster acceleration, faster travel speeds, power reserve for extra work-loads.

NEW! Faster lifting speeds. Lifting speed when loaded has been increased to 37 feet per minute.

NEW! Improved Hydratork Drive has greater gear reduction to convert higher engine speeds for more power.

NEW! Top gradeability. The most efficient operating power-train on the market today, provides power when you need it to climb the steepest grades.

No clutch—no gears to shift gives you better maneuverability, less driver fatigue—MORE WORK! Power multiplication through torque converter gives you extra power, smooth acceleration —MORE WORK! No clutch means easier driving, less down-time—MORE WORK! Anyway you look at it . . . you'll get *more* work with Clark's Hydratork Carloader. Ask your local Clark dealer for details.

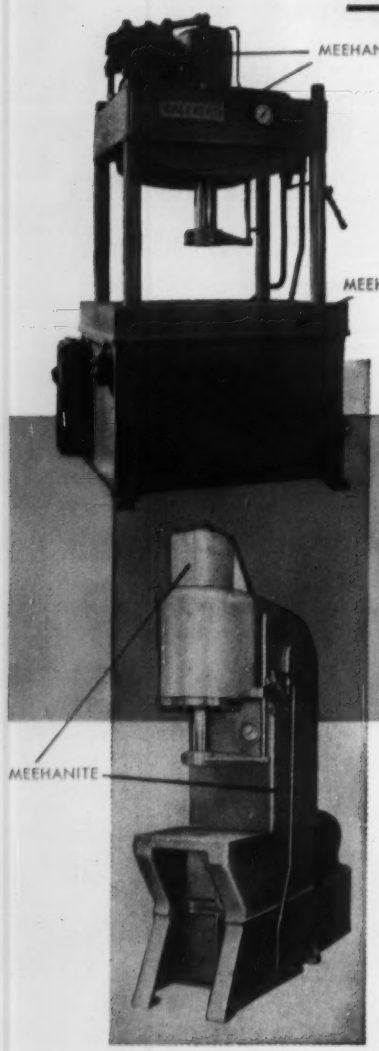
A BETTER BUY WITH LOCAL SUPPLY—*Genuine Clark Parts*

CLARK EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 26, Michigan

The MEEHANITE® Casting Reporter

ALL GREENERD PRESS CYLINDERS ARE MEEHANITE METAL



The Greenerd Arbor Press Company, Nashua, New Hampshire, specifies Meehanite metal for many of their important component parts and *all* of their Press cylinders.

These cylinders are cast of Meehanite Type GA (50,000 psi) as well as the top and bottom caps of Presses under 30 tons capacity. The 30-ton Hydraulic Press is of box-type construction and cast of tough, dense Meehanite metal which reduces the vibration to a minimum. The Meehanite cylinder is a separate unit, bored and honed to size.

The 75-ton, four-posted type Hydraulic Press is a rugged machine designed for all-around maintenance and production work. The head and table are also Meehanite castings providing high tensile strength which insures rigidity and uniformity; and, of course, the cylinder is also cast of Meehanite metal.

THE MANUFACTURER SAYS:

"All our cylinders today are Meehanite castings as well as the top and bottom caps of Presses under 30 tons capacity. We also used Meehanite castings for the main frame of our 30-ton Press and on the 75-ton Press, the head and work table are cast of Meehanite metal. Meehanite castings are used for all these parts because we are particularly interested in securing strong, extremely close grain and pressure tight castings."

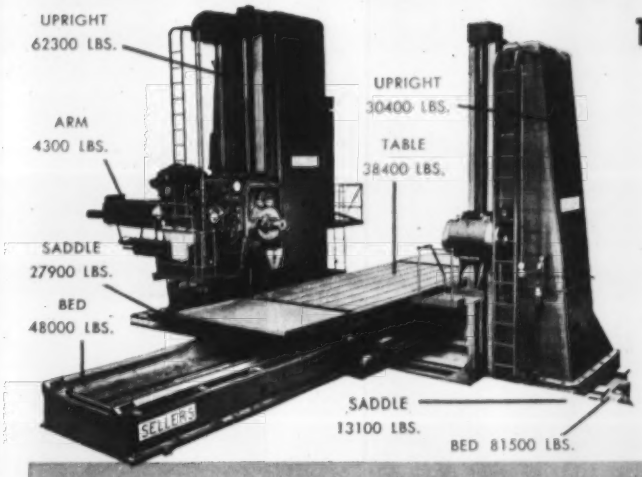
MEEHANITE METAL SPECIFIED FOR PRECISION-MACHINED SURFACE PLATES

The Goodman Manufacturing Company of Chicago, Illinois, has for years been making surface plates, one of the absolute necessities for answering the present-day requirement for greater precision in machine tool work.

THE MANUFACTURER SAYS:

"Our customers frequently specify the use of Meehanite castings for surface plates because Meehanite metal definitely provides the very fine grain structure and reduced deflection on the surface of a given surface plate for a given load, because of the superior physical characteristics of the material."

Industries report what Meehanite Castings have done for them



154 TONS OF MEEHANITE CASTINGS IN FARREL-BIRMINGHAM'S BIG SELLERS HORIZONTAL

A new Sellers, 8-inch, planer-type, horizontal boring, drilling and milling machine, built by Consolidated Machine Tool Company, Rochester, New York, has been installed in the Ansonia, Connecticut, plant of Farrel-Birmingham Company, Inc.

Meehanite castings from 27 different patterns were produced for this huge horizontal, ranging from a few pounds to 40½ tons. The more than 154 tons of Meehanite metal probably make over 90 per cent of the entire weight of this machine.

THE MANUFACTURER SAYS:

"We have long recognized the value of Meehanite metal's soundness and guaranteed physical properties to meet specific requirements. In this Sellers horizontal, for example, the heavy proportioning of the uprights and the superior vibration-damping qualities of Meehanite metal combine to practically eliminate deflection. The 96-inch x 204-inch table is likewise factored to resist sag under loads up to a maximum of 70 tons, thus permitting machining operations within extremely close tolerances.

In this case, as in thousands of other heavy machines and machine tools built with Meehanite castings under exacting controls from materials procurement to finished product, a highly satisfactory answer to our needs is being provided by Meehanite metal."

ONLY A MEEHANITE FOUNDRY CAN MAKE MEEHANITE CASTINGS

The American Laundry Machinery Co. . Rochester, New York
Atlas Foundry Co. . . . . Detroit, Michigan
Banner Iron Works . . . . . St. Louis, Missouri
Barnett Foundry & Machine Co. Irvington and Dover, New Jersey
Blackmer Pump Company . . . Grand Rapids, Michigan
Compton Foundry . . . . . Compton, Calif.
Continental Gin Co. . . . . Birmingham, Alabama
The Cooper-Bessemer Corp. Mt. Vernon, Ohio & Grove City, Pa.
Crawford & Doherty Foundry Co. . . . Portland, Oregon
DeLaval Steam Turbine Co. . . . . Trenton, New Jersey
M. H. Detrick Co. . . . . Newark, N. J. and Peoria, Ill.
Empire Pattern & Foundry Co. . . . . Tulsa, Oklahoma
Farrel-Birmingham Co., Inc. . . . . Ansonia, Connecticut
Florence Pipe Foundry & Machine Co. . Florence, New Jersey
Fulton Foundry & Machine Co., Inc. . . . Cleveland, Ohio
General Foundry & Manufacturing Co. . . Flint, Michigan
Georgia Iron Works Co. . . . . Augusta, Ga.
Greenlee Foundry Co. . . . . Chicago, Illinois
The Hamilton Foundry & Machine Co. . . . Hamilton, Ohio
Hardinge Company, Inc. . . . . New York, New York
Hardinge Manufacturing Co. . . . . York, Pennsylvania
Johnstone Foundries, Inc. . . . . Grove City, Pennsylvania
Koehring Co. . . . . Milwaukee, Wisconsin
Lincoln Foundry Corp. . . . . Los Angeles, California
Palmyra Foundry Co., Inc. . . . . Palmyra, New Jersey
The Henry Perkins Co. . . . . Bridgewater, Massachusetts
Pohlman Foundry Co., Inc. . . . . Buffalo, New York
Rosedale Foundry & Machine Co. . Pittsburgh, Pennsylvania
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Sonith Industries, Inc. . . . . Indianapolis, Ind.
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Hartley Foundry Division—
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Write for your copy of ***"The Handbook of Meehanite Metals"***

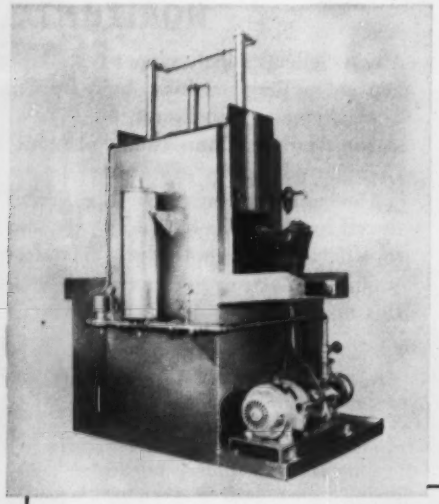
This Advertisement Sponsored by Foundries listed above

MEEHANITE METAL® CORP.

714 North Ave., New Rochelle, N. Y.

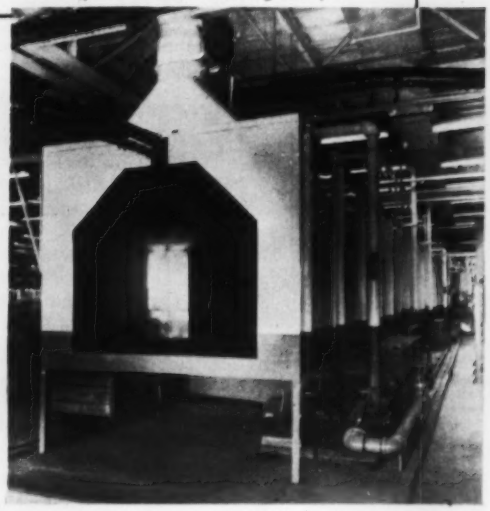
"CLEAN AS A WHISTLE"—

ELIMINATE CHANCE From Your Between-Operation Cleaning or Paint Preparation Needs . . . Whether Large or Small



P-D UNIT FOR CLEANING AERONAUTICAL CYLINDER HEADS

P-D AUTOMOBILE BODY BONDERITE SYSTEM
(photo shows "Entering End")



Peters-Dalton Power Spray Washers Are Designed and Built To the Job and For the Job

Modern metal finishing standards require washing equipment tailor-made for specific operations. This is essential to obtain the necessary product quality. It is too costly to take "chances" with the performance of these vital operations. All "chance" can be removed when you call upon Peters-Dalton engineers. They *can* and *will* specify the correct design and build the right type equipment to fulfill your own particular needs.

More than a quarter century stands behind P-D "know-how" for manufacturing equipment to handle your between-operation cleaning or paint preparation requirements. Peters-Dalton designers and engineers will lay out and produce the correct type of equipment to handle your job regardless of its size — whether a single unit or a complete installation. Depend on P-D to supply the services for meeting the production you have the right to expect. Just write, wire or phone.

Ask for our new Power Spray Washer Tech. Bulletin No. 301

Peters-Dalton INC.

- *Hydro-Whirl Paint Spray Booths*
- *Industrial Washing Equipment*
- *Drying and Baking Ovens*
- *Hydro-Whirl Dust Collecting Systems*

Built stronger, tougher and lighter with USS MAN-TEN Steel

Famous HYSTER Logging Arch handles more footage faster

In this "packaged" logging unit, consisting of a Hyster Arch Towing Winch and Caterpillar Diesel Tractor, the objective of the engineers was to produce equipment having the highest degree of mechanical efficiency, plus durability and speed of operation.

Because the key to profits is greater log production, which means that unnecessary breakdowns must be eliminated, extra margins of safety have been built into all parts subjected to stresses and wear.

By using USS MAN-TEN High Strength Steel in the arch boom, A-frame and tongue, it was possible to reduce weight of these important members by 10%, and yet to *increase* their strength-to-weight ratio over former construction.

The increased strength provided by MAN-TEN Steel gives the arch the ability to handle log loads of maximum size, and the reduced arch weight means greater mobility and maneuverability. Result: The operator can get into tight spots easier and pick up loads faster. Reduced weight also permits greater grade climbing ability in steeper terrain.

With USS High Strength Steels — USS MAN-TEN, USS COR-TEN and USS TRI-TEN—you can build extra strength and toughness into vital parts and ensure greater resistance to wear, fatigue, abrasion and impact.

Photographs courtesy of HYSTER COMPANY, Portland, Oregon

NOW AVAILABLE . . . Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead giving your title or department, to United States Steel Corporation, Room 4781, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

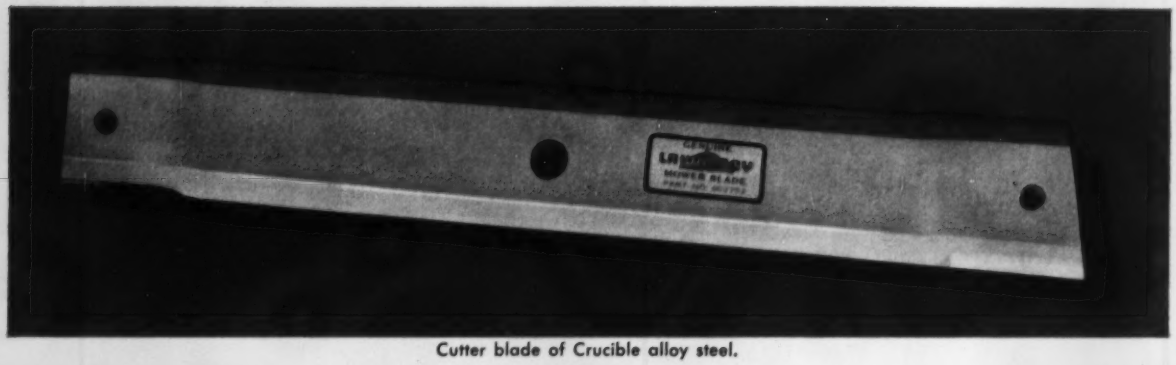
USS MAN-TEN HIGH Strength STEEL

USS

5-1028

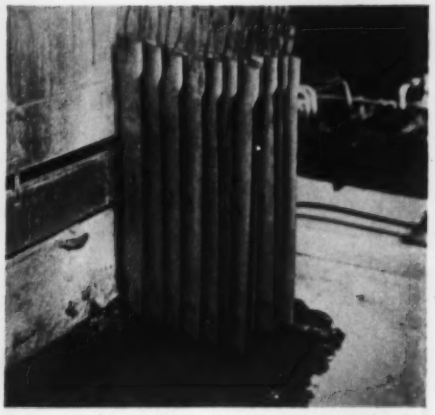
See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

UNITED STATES STEEL



Cutter blade of Crucible alloy steel.

First step in manufacture of cutter blade. Crucible beveled blade alloy steel is fed through this 100-ton press, where it is cut to length and holes punched.



Next, lengths are formed to shape on a hydraulic press, and then given a tempering bath as shown.

CRUCIBLE ALLOY STEEL *cuts blade damage in rotary mowers . . .*

Lawn-Boy mower. Built by RPM Manufacturing Co., Lamar, Mo., a subsidiary of Outboard, Marine & Manufacturing Company, maker of Johnson & Evinrude outboard motors.

Rotary lawnmower cutter blades, whirling at high speeds, often hit small rocks or bits of trash. Ordinary steels just can't take that sort of rugged treatment. They chip, crack — wear out far too quickly. That's why in leading mowers, like the new *Lawn-Boy*, you'll find special *alloy* steel cutter blades *designed for reliable performance.*

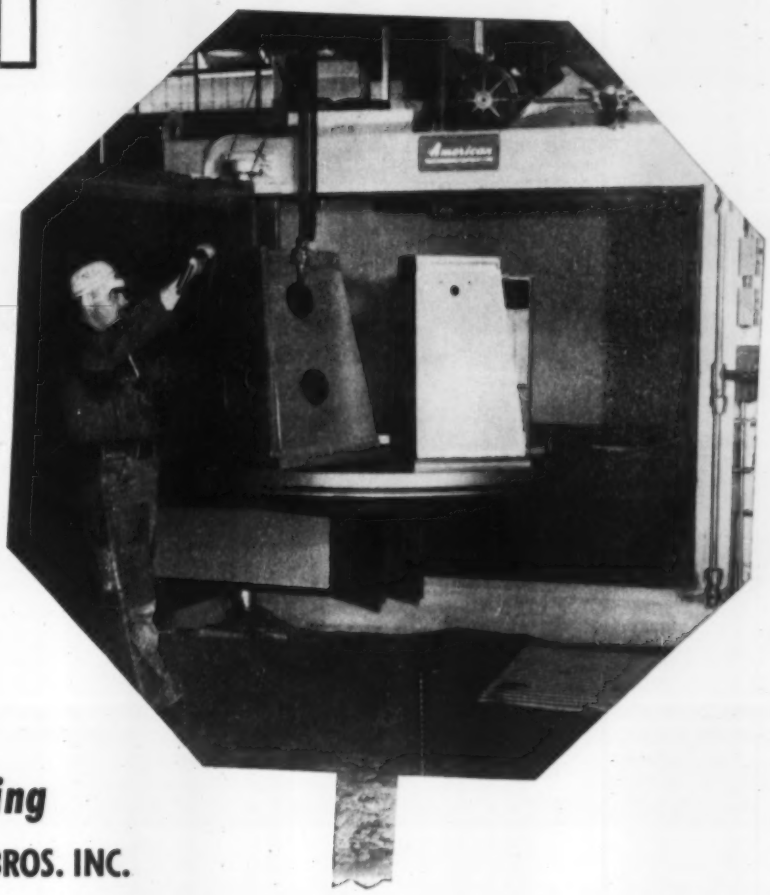
For Crucible has developed a *special alloy steel* made to give the best possible combination of toughness and hardness for long-lasting edges—and formability and ductility for ease of manufacture. It's been so successful that *Crucible is now the largest producer of lawnmower steels.*

Most Crucible steels are designed to fill *special* needs. If you have an application where ordinary steels won't do, come to Crucible. Take advantage, too, of the dozens of technical booklets and data sheets Crucible has prepared to help you make the best use of special steels. For a free publication catalog, write *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

STOP grinding profits away!



WHEELABRATOR®
BLAST CLEANING
cut weldment grinding time 75% at SCIAKY BROS. INC.

In making resistance welding machines, Sciaky Bros., Inc., ground the entire surface of their weldments because mill scale was very resistant to wire brushing. Some fabricated pieces, like top arms for a spot welder, shown above, required 1½ to 3½ hours of grinding to remove scale, weld spatter and rust.

Now all foreign materials right down to the virgin metal are removed from such pieces in just 4 minutes with Wheelabrator airless abrasive blast cleaning.

Grinding has been cut from an average of 2 hours per piece to a maximum of ½ hour. It is done after Wheelabrating only to remove excess metal. Efficient scale removal also has helped to lengthen tool life in subsequent machining operations.

Wheelabrator cleaning also has provided a surface that is excellent for bonding the paint applied to the finished machines.

Whether your work is weldments, castings, forgings, heat-treated parts, stampings or any of the other metal parts, there is a Wheelabrator machine that will speed production and greatly reduce cleaning costs.

Investigate the Wheelabrator today. For complete details, send for Bulletin 74-B.

American WHEELABRATOR® *originator of airless blast cleaning*

AMERICAN WHEELABRATOR & EQUIPMENT CORP., 509 S. Byrkit St., Mishawaka, Indiana

Typical Koppers-Becker Coke Ovens. This battery of 65 ovens carbonizes approximately 1,400 net tons of coal per day at a coking rate of 1.08 inches per hour.

the PLUS FACTOR in Koppers Engineering Services

ANY company, engaged in metallurgical construction, must have engineering skill. It is the *common* denominator that goes into every one of our construction assignments.

Included in Koppers Metallurgical Engineering and Construction Services is a value that is of intangible, but very real benefit to the company's customers. This value is based on more than fundamental engineering skills. Rather, it stems from all of the varied knowledge, techniques and background that have been acquired over the years by Koppers Engineers in handling the most exacting metallurgical construction projects.

Difficult to define or measure, this unseen value is in fact the Plus Factor of Koppers Engineering Services that makes for customer satisfaction. You are invited to consult with our Engineers and Management.

For any kind of metallurgical construction
YOU CAN COUNT ON KOPPERS

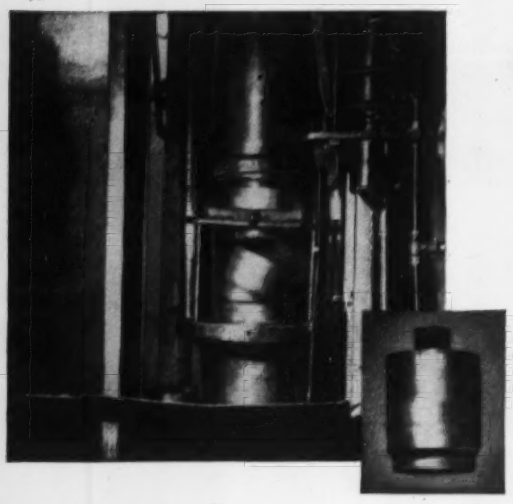
KOPPERS®

Engineering and Construction Division

KOPPERS COMPANY, INC.
Pittsburgh 19, Pennsylvania

New Freyn-Design Blast Furnace. Soaring 225 feet skyward, this furnace has a hearth diameter of 25 feet and a capacity of 1,100 net tons of iron per day.

Look How You Save by Hard-Facing

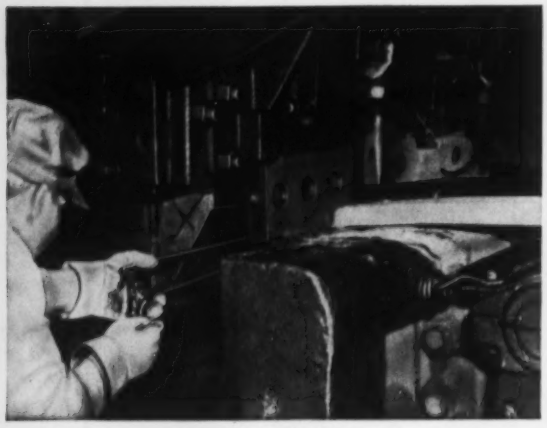


PRODUCTION LIFE INCREASED 1000%

This hard-faced punch mandrel has produced 10,000 pipe couplings and still shows no sign of losing gage. Unprotected tool steel mandrels wore out after punching only 1000 pieces, and case-hardened mandrels punched only 500 pieces before they had to be replaced. A 3/16-in. layer of HAYNES STELLITE hard-facing alloy protects the mandrel from wear and galling.

SAVES $4000 PLUS

Rebuilding this worn extrusion screw with HAYNES STELLITE alloy No. 1 cost $2000—$4000 less than a new screw would cost. And the rebuilt screw will give from 4 to 6 times more service than a new, unfaced screw. The screw is used to extrude rubber from a solid to a semi-liquid state. Wear is the chief problem, and it is effectively resisted by the hard-faced surfaces.



SHEAR 4 TIMES THE TONNAGE

These hard-faced blades shear an average of 200 tons of tough alloy billets. This is more than 4 times the average for special steel blades. Hard-facing with HASTELLOY alloy C protects the blades from wear, and they keep a keener cutting edge longer. When the blades finally do wear, they can be hard-faced again at a fraction of their replacement cost.

FREE—

Write for the 40-page "HAYNES Hard-Facing Manual."

HAYNES *alloys*

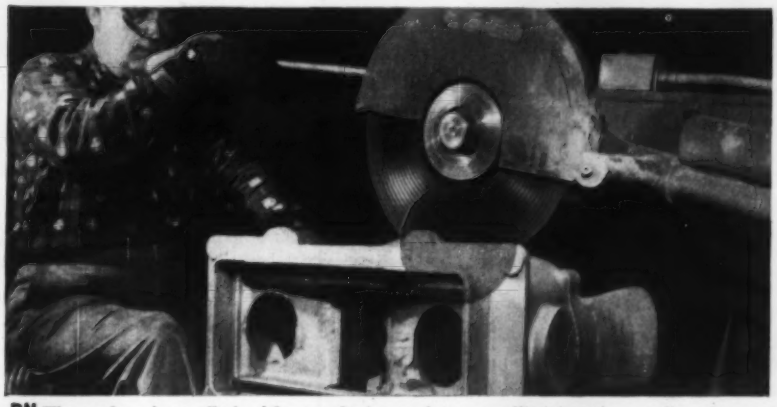
Trade-Mark

Hard-facing products made from cobalt-base alloys, nickel-base alloys, and tungsten carbide in the form of rod, wire, and coils.

"Haynes," "Haynes Stellite," "Hastelloy" are trade-marks of Union Carbide and Carbon Corporation.

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles—New York—San Francisco—Tulsa

BF A Universal favorite for removing light welds, breaking edges on machined work, deburring, taking off flash from plastic parts and many other light portable and bench grinding operations. To be used on periphery only.



BN The preferred cut-off wheel for non-ferrous and non-metallic jobs. Also excellent for cutting wire rope, slotting rails, tuck pointing, etc. Used on swing-frame and stationary type cutting-off machines, large and small portables.

BF MOUNTED WHEELS AND POINTS have the same strong laminated construction as the larger BF wheels. For polishing die cavities, chamfering, Brinell spotting, etc. For hand finishing, use BF sticks.

BD A specialist in heavier stock removal, such as welds on fabricated work, smoothing flame-cut edges, cleaning between teeth of gear castings, etc. — also for slotting, notching and cutting-off.

BFR Excels at the lighter portable jobs, such as rust and scale removal, light weld grinding, scarfing and beveling, blending contours, notching gates and risers.

The jobs they do!...The money they save!

Norton Reinforced Wheels add the "TOUCH of GOLD" *to countless everyday grinding jobs*

With Norton Reinforced Wheels you get extra-long service life, exceptional strength and fast, cool, trouble-free grinding — the Norton-engineered "Touch of Gold" that saves you money in the widest range of routine grinding jobs, from light deburring to heavy cutting-off.

To this top grinding performance Norton Reinforced Wheels add a wide margin of safety. All four are resinoid bonded and reinforced by layers of tough fabric molded into them. As follows:

BF — *Semi-flexible straight wheel, cotton fabric reinforcement. Also available in mounted wheels, points and hand sticks.*

BN — *Straight wheel with glass cloth reinforcement. Primarily a cut-off wheel, its rough, knurled sides provide additional cutting action.*

BD — *Rigid hub-type. Glass cloth and Nylon reinforcement. Designed especially for right angle portables and disc sanders.*

BFR — *Semi-flexible hub-type. Cotton fabric and Nylon reinforcement.*

SEE YOUR NORTON DISTRIBUTOR

for a demonstration of Norton Reinforced Wheels in your shop. Ask him for the big new catalog on Reinforced Wheels. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone book, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

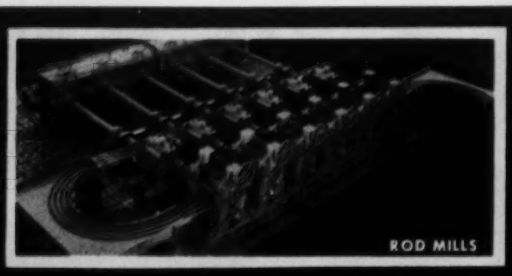
Making better products . . . to make your products better

W-1638

NORTON

and its BEHR-MANNING division

NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes



around the world...

BIRDSBORO...

is known for dependable mill equipment!

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

• Whatever you need in mill equipment . . . wherever you need it . . . BIRDSBORO is ready to give you "customized" service, from the manufacture of a single unit to the design, building and installation of complete mills and auxiliary equipment.

MM 43-55

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

EXTRA VALUE..FROM GASOLINE TO SUN'S METALWORKING OILS

Sun Oil Company makes over 400 petroleum products ...refines better value into every one of them

Sun puts the same extra value into its metalworking oils that it puts into famous Blue Sunoco—Premium Performance at Regular Price.

EXAMPLE: About ten years ago Sun became aware of a hidden source of trouble in metalworking... inadequate lubrication of the ways which support the tables or carriages during a machining operation. The costly result of this inadequate lubrication is called "stick-slip" or jumpy table. This stick... slip...stick (or jump) is often less than a thousandth of an inch...hard to detect and yet enough to cause poor finish, rejects, reduced tool life and a fall-off in production.

SOLUTION: Sun developed its now famous Sunoco Way Lubricant—a product so outstanding in its ability to overcome "stick-slip" that today, more than ten years later, it still is the standard of the metalworking industry.

RESULT: The extra value of Sunoco Way Lubricant has been proved so conclusively that it is approved by more than 55 of the country's leading machine tool manufacturers.

For EXTRA VALUE in petroleum products... buy Sun!

Please turn to the next page

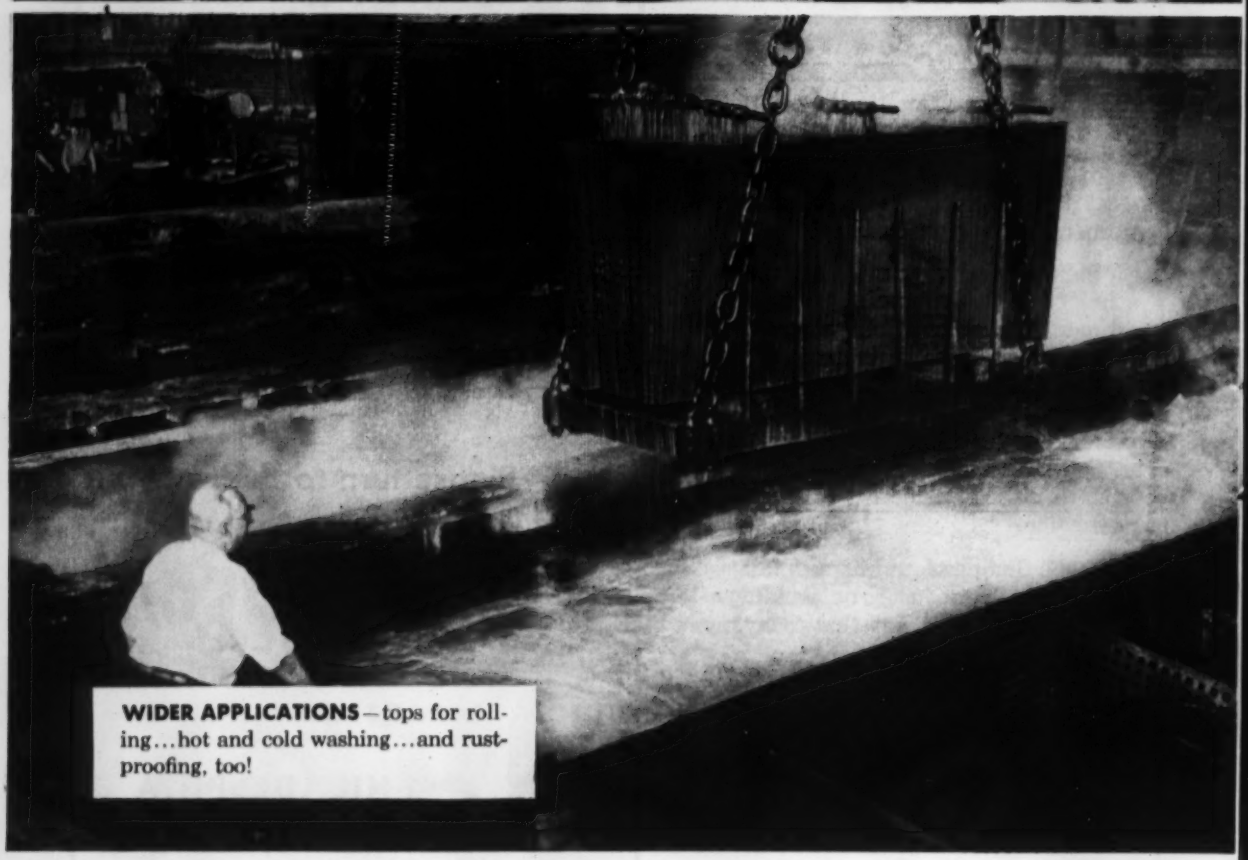
SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

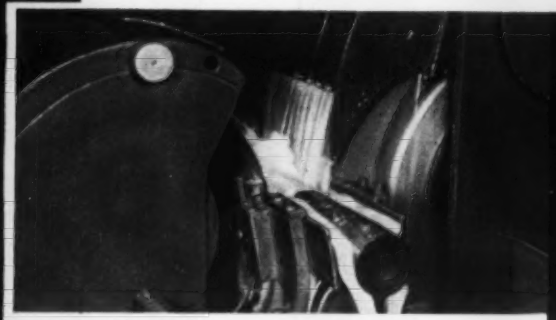
SUN OIL COMPANY PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY LTD., TORONTO AND MONTREAL

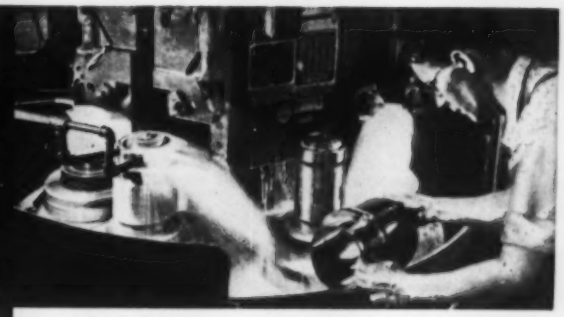
GREATER COOLING POWER—better finishes...tools last longer...production costs reduced.



WIDER APPLICATIONS—tops for rolling...hot and cold washing...and rust-proofing, too!



INCREASED DETERGENCY—prevents loading and glazing of grinding wheels, prolongs wheel life.



NEW S.E.C.O.—pours and mixes easily... has better operator acceptance . . . keeps parts and machines cleaner.

Industry's most widely used soluble cutting oil continues to give highest machining efficiency

OVER 100 MILLION GALLONS OF S.E.C.O. EMULSIONS USED IN '54

The reasons? Simple.
Primarily, industry has faith in Sunoco Emulsifying Cutting Oil. Its high machining efficiency has proven itself over a period of years. S.E.C.O. is the original 100% petroleum emulsifying cutting oil. 'Way back in 1916, machinists started using S.E.C.O.

Constantly improving in quality over the years, S.E.C.O. is now better than ever. During 1954 new refining facilities once more improved industry's most widely used cutting oil... gave users even higher machining efficiency ...better finishes... longer tool life... increased production.

Test the new S.E.C.O. in your own plant. Notice how its high detergency and purity keeps tools, parts and machines clean... how easily it mixes in hot, cold or hard water. Notice, too, how S.E.C.O. cuts operating costs... improves rolling operations, hot and cold washing, and rustproofing.

See for yourself why Sun's S.E.C.O. continues to be the leading emulsifying cutting oil in the country today. For information, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-6.

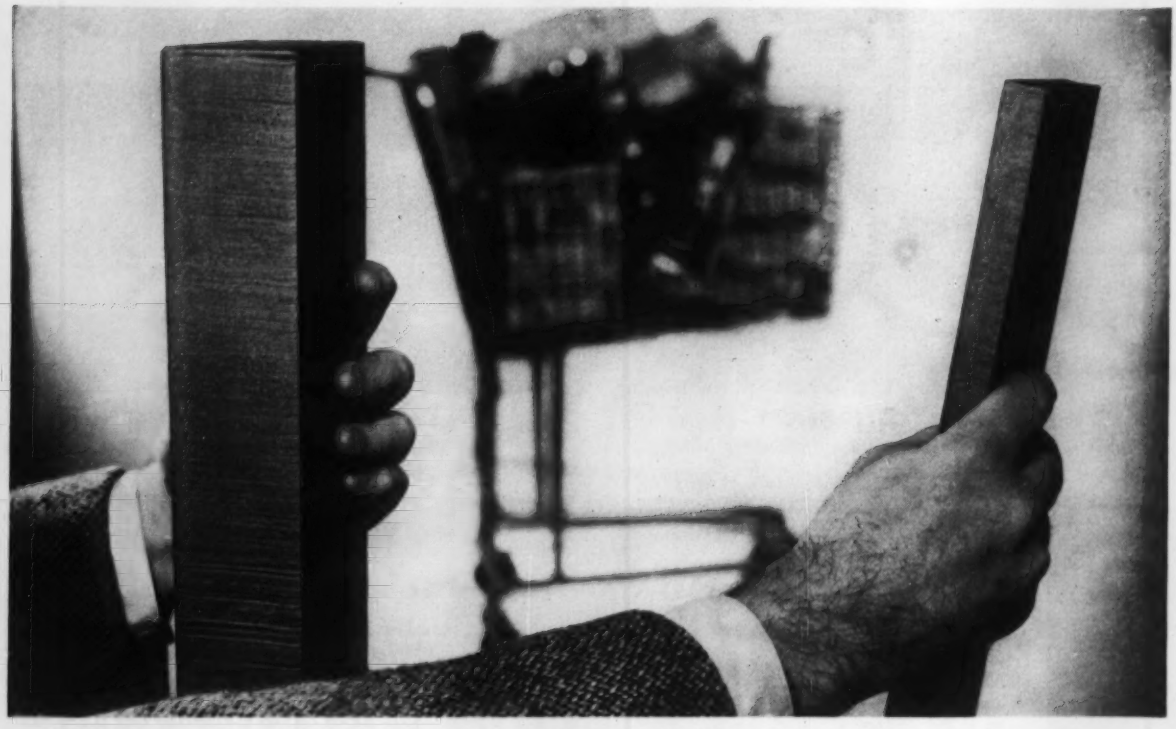
SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY LTD., TORONTO AND MONTREAL



Which is the ECONOMY SIZE?

3 times stronger than carbon steel, Lukens "T-1" steel slashes equipment weight, reduces costs

The lighter weight, reduced thickness of Lukens "T-1" steel, in comparison to heavier, thicker plates of ordinary carbon steel, makes possible substantial over-all savings in material and fabrication costs for equipment builders. This new all-purpose steel—a unique, low-carbon, quenched and tempered alloy plate steel—has a yield strength three times greater than ordinary carbon steel. It can cut costs by reducing weight and still increase payload and efficiency.

Equipment fabrication is no problem with Lukens "T-1" steel. It is readily welded without preheating or stress relieving; equipment can easily be fabricated, modified or repaired at the field site. Its exceptional toughness and resistance to wear and impact lowers maintenance costs and lengthens equipment life. Additional savings are possible where Lukens' range of steel plate sizes—including the widest and heaviest available anywhere—makes possible the use of wider sizes that require fewer welded seams.

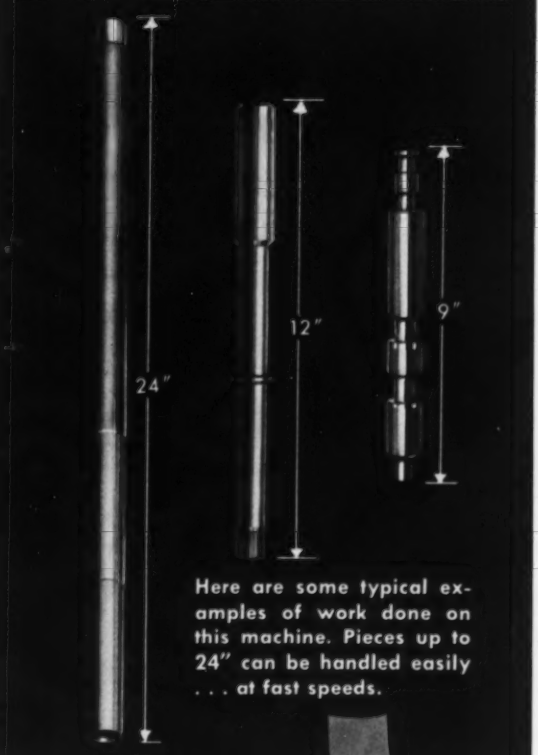
Lukens "T-1" steel is the most recent addition to Lukens' complete line of carbon, alloy and clad steels. Its unusual combination of properties suit it especially to application in pressure vessels, bridges, shipbuiliding, construction machinery and general industrial equipment. On problems of design, selection, application and fabricating techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write for Bulletin 765 on its properties, characteristics and applications. Address: Manager, Marketing Service, 773 Lukens Building, Lukens Steel Company, Coatesville, Pa.

LUKENS

"T-1" STEEL THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

LUKENS STEEL COMPANY, COATESVILLE, PA.

impossible to machine long parts AUTOMATICALLY on your present equipment?



Here are some typical examples of work done on this machine. Pieces up to 24" can be handled easily . . . at fast speeds.

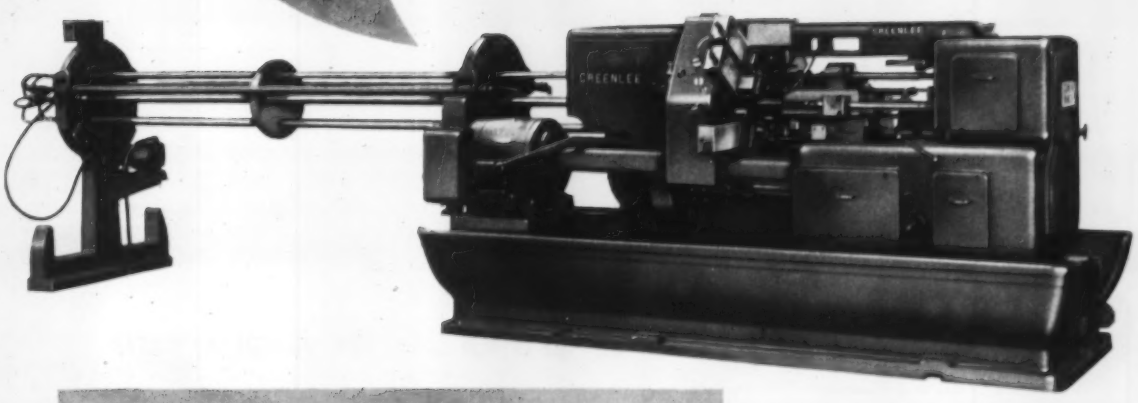
IT'S EASY... IT'S ECONOMICAL

with a GREENLEE SIX-SPINDLE BAR

AIR-FEED AUTOMATIC

This machine puts you in an enviable competitive position. Production goes up . . . costs go down. Check its many advantages: (1) Feeds out stock to 24" (2) Has multiple feed-out (3) Eliminates stock scoring (4) Reduces stock reel noise (5) Eliminates stock pushers and feed-out cams. Especially worth noting is the fact that the stock can be fed out in one or more positions during either the index cycle or feed cycle.

Additional data will gladly be sent on request. Write today.



PRODUCTION MACHINERY
GREENLEE

GREENLEE BROS. & CO.
1926 Mason Ave.
Rockford, Illinois

WRITE FOR COMPLETE INFORMATION

Capsule Case History:

From A to Z...

No matter how varied or complex the related facilities involved in the design and construction of your new plant, Kaiser Engineers has the breadth of experience and qualified personnel to assume sole responsibility for the design and construction of the complete project.

Building a Steel Mill
from the ground up is a complex project requiring the combined efforts of many crafts, trades and services, of diverse engineering skills and construction know-how.

Kaiser Engineers team of specialists designed and built the West Coast's only integrated steel mill from coal and iron ore mines, blast furnaces and rolling mills, to air pollution control of the open hearth stacks.

Write today for a 20-page illustrated reprint of the Fontana story and for the new KE steel industry brochure (No. 106).

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DIVISION OF HENRY J. KAISER COMPANY

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YOU USE BRICK TO BUILD A BUS

Behind everything that's made or moved lies the refractory brick that contains the flames, the enormous heats, of industry.

Without refractory brick, you'd see no bus in this picture. Nor any picture, for that matter.

Making refractories for the infinite requirements demanded of them is a precise and exacting science, stemming from vast resources of mines, minerals and laboratory control.

And General Refractories provides them from multiple plants and warehouses strategically located to serve industry swiftly . . . dependably . . . economically.

GENERAL REFRACTORIES CO.
Philadelphia 2

GENERAL REFRACTORIES

FOR THE METALS INDUSTRY . . .

OLIVE HILL
—The world's most renowned blast furnace brick (it is a strong and dense fireclay product)—with superior resistance to slag, load, abrasion, carbon disintegration, and alkali attack.

RITEX—
Unburned basic brick—in magnesite, magnesite-chrome, and chrome-magnesite. More resistant to spalling. Lower porosity, lower thermal conductivity—high hot strength.

STEELKLAD
—A Ritex basic brick, permanently jacketed in a patented steel shell. Just one of many superior GREFCO products.

This is a plain Ruff-L-Buff after wearing off about one inch in testing operations and then trimming. Loose threads, broken material and numerous small holes due to excessive heat and abrasion of the cloth are apparent.

30% LONGER BUFF LIFE

The Binderized Ruff-L-Buff shown here was subjected to the identical test undergone by the untreated buff — yet look at the difference! Notice the absence of thread or cloth breakage of any kind, proof of Binderizing's effect on buff life.

with New H-VW-M Binderized* Ruff-L-Buffs®

Not just "another type of buff", but a revolutionary new H-VW-M process which impregnates the entire Ruff-L-Buff with the same organic binder used in buffing compounds. From these new "Binderized" Ruff-L-Buffs come a host of practical, cost-cutting advantages, proved over many months in actual production line operations.

Item by item, these are the six major advantages of the H-VW-M Binderized Ruff-L-Buff.

- **Longer buff life** – damage from overheating eliminated by pre-lubrication of buffing material, preventing excess frictional heat caused by constant flexing. This additional buff life has averaged 30% in actual test runs.
- **Better compound adherence** – the binderizing impregnation creates an affinity between buff and compound. The compound does the cutting, not the buff.
- **Faster cutting action** – more compound is retained on the buff, insuring an even cut for a longer period without re-application of compound.
- **Extended composition life** – additional binder in the cloth ensures better abrasive adhesion, longer life of both composition and buff.
- **Heading-up time** – new wheels require only application of the compound to be ready for immediate operation.
- **Cooler running** – in addition to pre-lubrication, six holes in the center and twelve air channels in the center rim provide a forced air circulation over all cloth surfaces.**

And, of course, Binderized Ruff-L-Buff retain such important features as *bias-cut cloth* to prevent unravelling, *perfect buff balance* for uniform rotation and wear, and *exclusive Red-E-To-Use face* that takes compound without need for surface preparation.

H-VW-M bias-cut Sisalweev buffing wheels are also available in Binderized types.

* Patent Pending
** Patent No. 2,140,208

For complete information on H-VW-M Binderized Ruff-L-Buffs and other specialized buffs write for Bulletin No. B-102.

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO. • MATAWAN, N. J.

Plants: Matawan, N. J. • Grand Rapids, Mich.

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H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

For Uniform Heat Treat Response

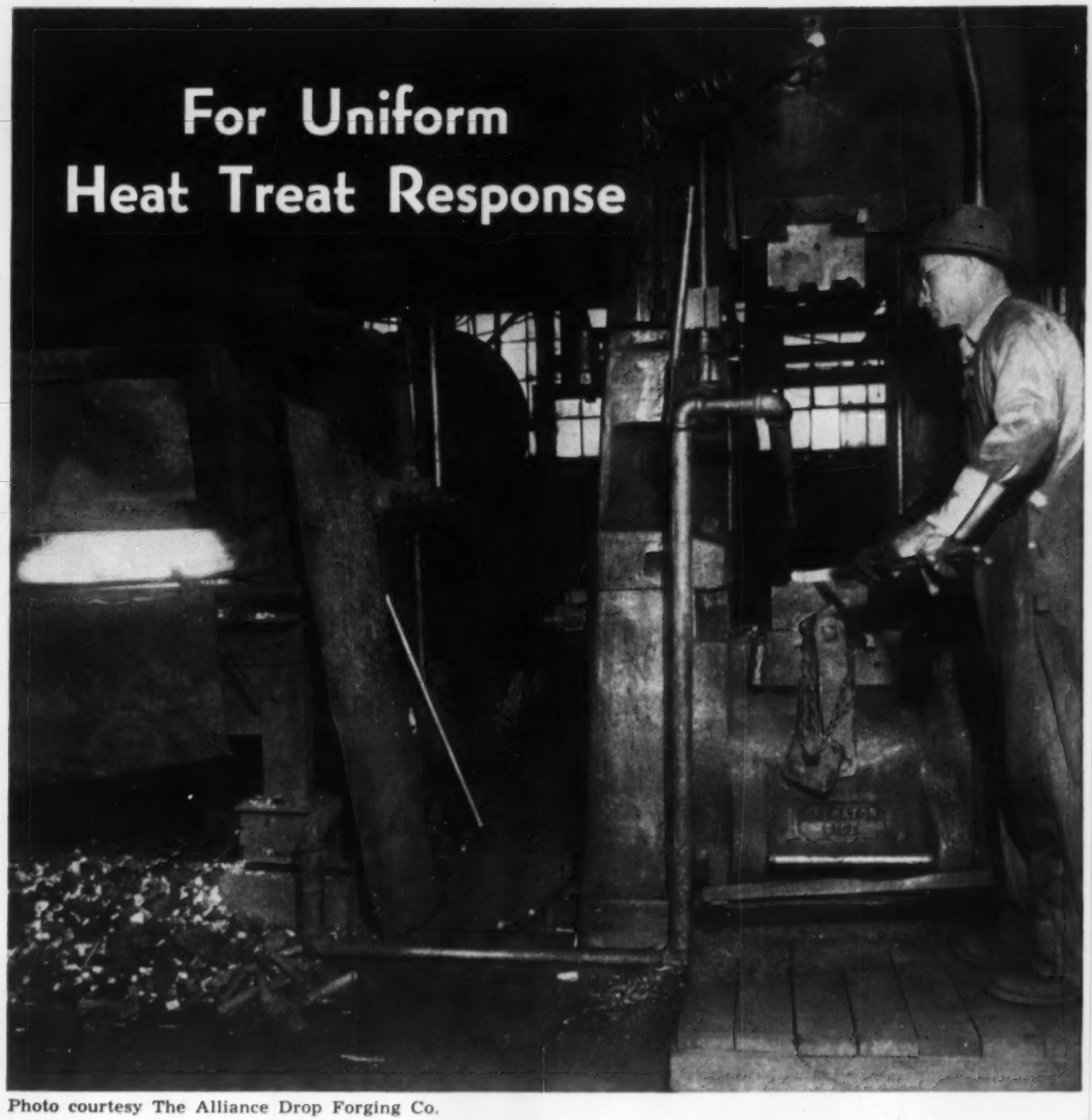


Photo courtesy The Alliance Drop Forging Co.

●Youngstown Hot Rolled Alloy Bars assure uniform response in our customers operations because such uniformity starts at the Ore Mines. At every operation, in Youngstown's completely integrated steel manufacturing facilities, rigid quality controls make certain that uniform chemistry, physical properties and dimensions are furnished.

SPECIFY

Youngstown

Hot Rolled QUALITY YOUNGSTOWN SERVICE Alloy Bars

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

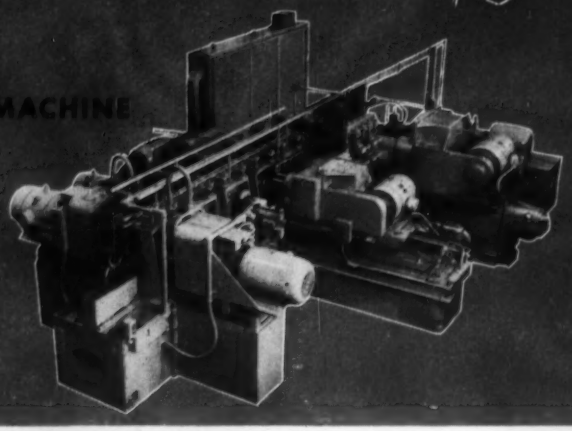
SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

10 Station Automatic In-Line

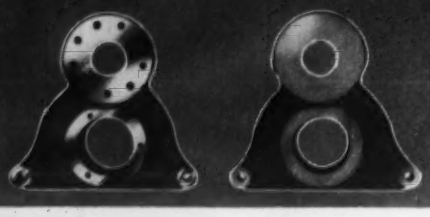
BAKER TRANSFER MACHINE

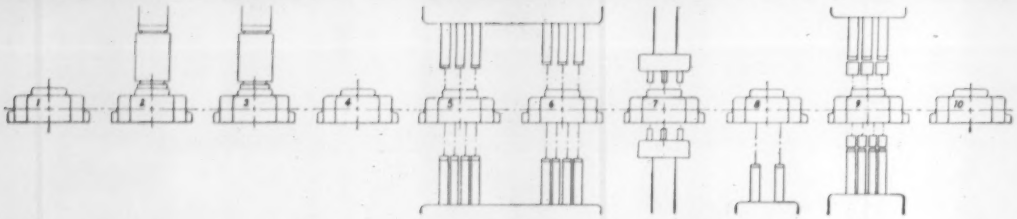
Performs Multiple Operations on Tractor Housings

THE MACHINE



THE PART





THE OPERATIONS

STATION NO. 1
LOAD 1 PART

STATION NO. 2
UNIT NO. 1
COMB. SEMI. FIN. BORE 5.165 & 3.249 & 2.861 DIAS.
COMB. SEMI. FIN. BORE 4.425 THRU BOTH WALLS

STATION NO. 3
UNIT NO. 1
COMB. FIN. BORE 5.180 & 3.264 & 2.876 DIAS.
COMB. FIN. BORE 4.440 THRU BOTH WALLS

STATION NO. 4
IDLE

STATION NO. 5
UNIT NO. 2 "U" DRILL 5 HOLES
31/64 DRILL 6 HOLES

UNIT NO. 3 31/64 DRILL 8 HOLES
21/32 DRILL 1 HOLE
"U" DRILL 6 HOLES
23/32 DRILL 1 HOLE

STATION NO. 6
UNIT NO. 2 ½ CHAMFER 5 HOLES
⅝ CHAMFER 6 HOLES

UNIT NO. 3 ⅝ CHAMFER 7 HOLES
13/16 CHAMFER 1 HOLE
½ CHAMFER 6 HOLES
23/32 DRILL 1 HOLE
COMB. COUNTERBORE
.796 & CHAMFER 1 HOLE

STATION NO. 7
INSPECTION

STATION NO. 8
UNIT NO. 4
.6910 REAM 1 HOLE
.8157 COUNTERBORE 1 HOLE

STATION NO. 9
UNIT NO. 5 7/16-14 N.C. TAP 5 HOLES
9/16-12 N.C. TAP 6 HOLES

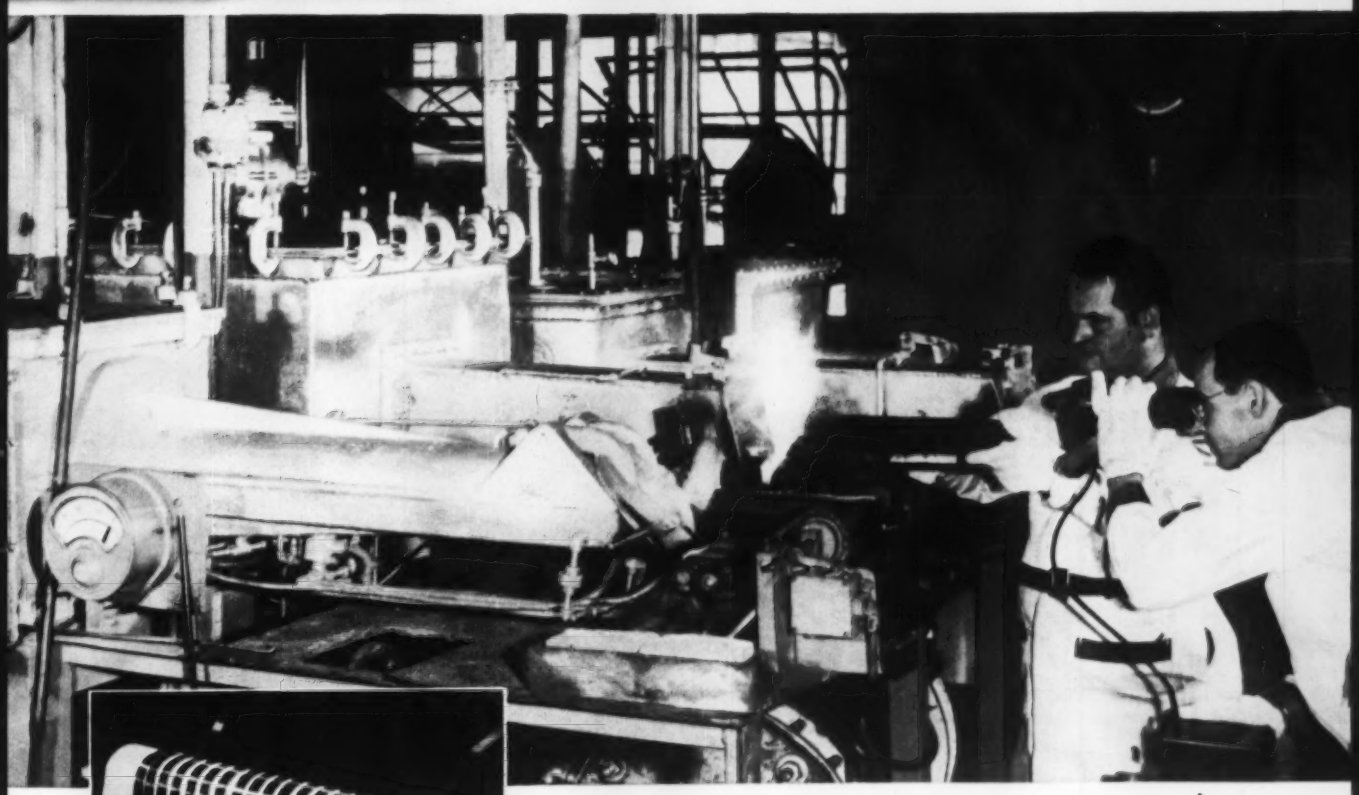
UNIT NO. 6 7/16-14 N.C. TAP 6 HOLES
9/16-12 N.C. TAP 7 HOLES
½-14 N.P.T. TAP 2 HOLES

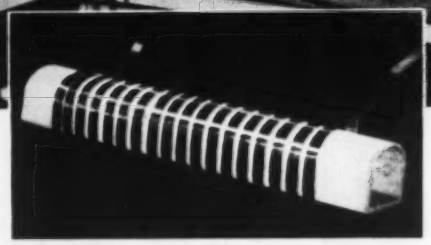
STATION NO. 10
UNLOAD 1 PART

Whatever Your Specific Job Problem, Consult Baker Engineers. Write

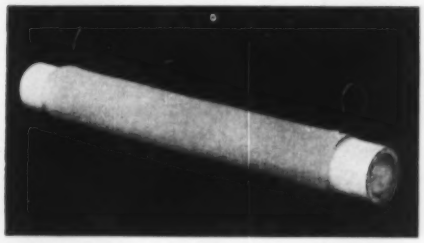
BAKER BROTHERS, INC., TOLEDO, OHIO

DRILLING • TAPPING • KEYSEATING • CONTOUR GRINDING MACHINES

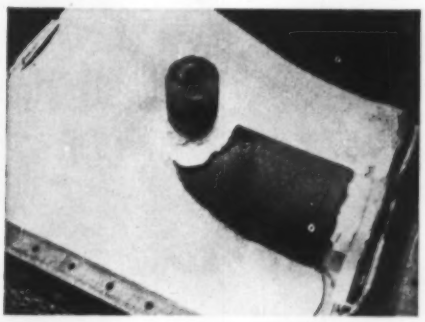




This molybdenum ribbon-wound ALFRAX muffle is rugged and long-lasting.



ALFRAX tubes and muffles will not react with atomic hydrogen.



Complete insulation with alumina "bubbles" . . . by the shovelful.

For high-temperature electric furnaces

ALFRAX® REFRACTORIES

resist atomic hydrogen and extreme heat

. . . are easily installed!

CARBORUNDUM® has developed a complete line of refractories for hydrogen or cracked-ammonia atmosphere furnaces heated by molybdenum elements. ALFRAX PK refractories are made of pure granular alumina and resist temperatures up to 3000 F. (They contain no silica or reducible oxides . . . to be affected by atomic hydrogen formed at these extreme temperatures).

ALFRAX materials come in a wide variety of forms to fill furnace-design needs:

. . . **as muffles, tile, brick,** or other normally required special shapes.

. . . **as tiny bubbles of pure alumina** that can be shovelled into muffle-type furnaces . . . for insulation between the shell and the wound muffle.

. . . **as pure alumina castable cement** that is simply mixed with water for use anywhere you want the convenience of a castable.

. . . **as embedding cement** to coat heating elements . . . that insulates and withstands extreme heat.

ALFRAX refractories offer other advantages—chemical inertness, excellent electrical resistance at high temperatures, and dimensional acccuracy. Write today, for your free copy of our booklet on these refractories for high-temperature electric furnaces. Address Dept. W65, The Carborundum Company, Refractories Division, Perth Amboy, N. J.

CARBORUNDUM
Registered Trade Mark

. . . also offers these advanced special-purpose super refractories: silicon carbide • fused aluminum oxide • electric furnace mullite • stabilized zirconia • boron nitride • boron carbide • zirconium boride • titanium boride • chromium boride • molybdenum boride • nickel aluminide.

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AL MANAGER • CHIEF ENGINEER • VICE PRESIDENT MANUFACTURING ER • RESEARCH DIRECTO

RESIDENT OPERATIONS • GENERAL SUPERINTENDENT • PARTNER • WO TOR INDUSTRIAL ENGINE

Influence **all levels** of

DEVELOPMENT ENGINEER • FACTORY MANAGER • LABOR RELATIONS ORKS MANAGER

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MANAGER • FACTORY SUPERINTENDENT • CHIEF METALLURGIST • SAL RINTENDENT

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metalworking management...

Build the strength of STEEL

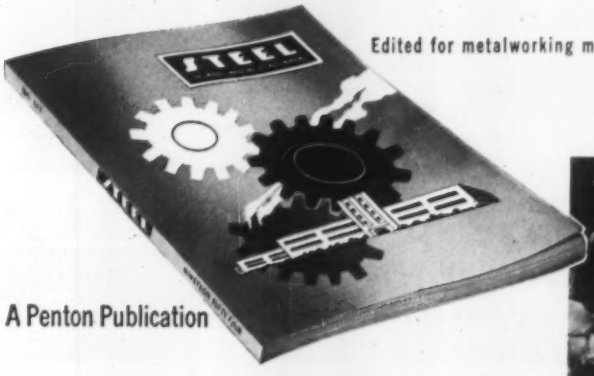
into your advertising program

STEEL's strength is in the dynamic way it is meeting the information needs of the Management Group in metalworking today.

That's the big advantage you get with STEEL. It's strong with the decision makers. You need their confidence . . . their vote . . . to get your product in and keep it in.

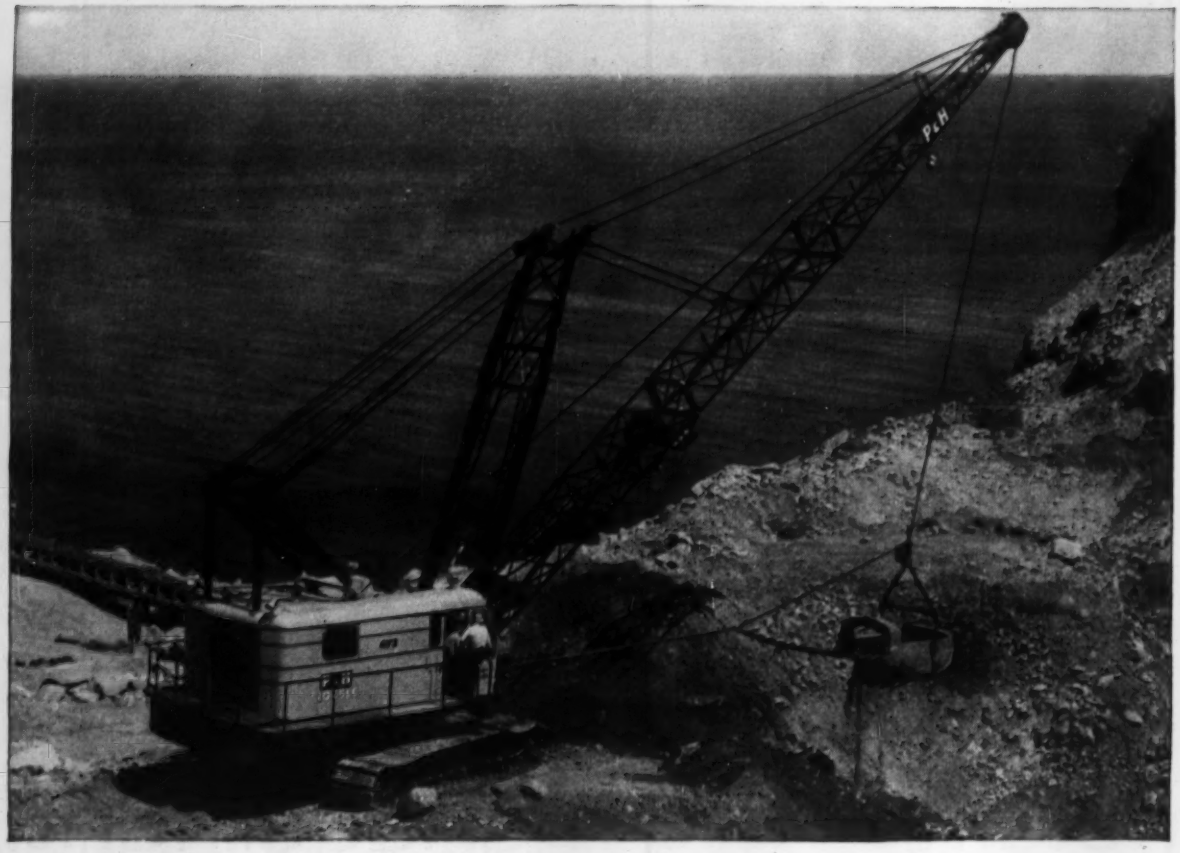
STEEL focuses on their interests—on the management problems of administrative, production, engineering and purchasing men at *every level*. It reports to them each week on news in the world's biggest industry—interpreting its *significance* to profits, competitive advantages, employee relations, customer satisfaction.

It's a communications service STEEL's improvement-minded audience uses regularly to keep informed . . . a *plus value* that strengthens your advertising in STEEL and makes it your *best buy!*



Edited for metalworking men at every management level . . .

A Penton Publication



GRAVER Fabricates All-Welded Revolving Frames for P&H Power Shovels

The versatile P&H Dragline pictured above, feeding rock onto a conveyor (Model 1055 LC) uses an all-welded revolving frame for extra strength. Graver recently fabricated five such assemblies for the Harnischfeger Corporation, one of which is shown in the inset.

This is an integrally welded rigid unit of box section design to withstand the great variety of stresses it will encounter. Traditional Graver quality is seen in the uniform welds which were inspected during manufacture by the most modern and comprehensive techniques. These include the initial accurate dimensional inspection on specially designed layout tables, periodic visual inspections, and magnetic particle and X-ray inspections.

Graver has achieved a reputation for developing new equipment and advanced techniques and is expert in welding carbon and stainless steels, and aluminum. For the more complex, difficult welding problems consult your Graver engineering representative. Meanwhile write for new illustrated brochure, "WELDMENTS."

GRAVER ... *source for quality weldments*

GRAVER TANK & MFG. CO., INC.

East Chicago, Indiana

CHICAGO • NEW YORK • PHILADELPHIA • EDGE MOOR, DEL. • CATASAUQUA, PA. • PITTSBURGH • CLEVELAND • DETROIT • TULSA • SAND SPRINGS, OKLA. • HOUSTON • ODESSA, TEXAS • CASPER, WYO. • LOS ANGELES FONTANA, CAL. • SAN FRANCISCO

McLouth
HIGH QUALITY
Steel

We are now operating the first Oxygen Steel Process in the United States. This dramatic new method of refining is producing high quality steel with a low nitrogen content.

The advantages of the Oxygen Steel Process are another reason why McLouth high quality sheet and strip steels will serve you better in the product you make today and the product you plan for tomorrow.

McLOUTH STEEL CORPORATION

Detroit, Michigan

MANUFACTURERS OF STAINLESS AND CARBON STEELS

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says plant engineer at Taylor Forge & Pipe Works, Cicero, Ill.

The average temperatures above the heat-treating and stress-relieving ovens at Taylor Forge range from 140 to 160 F and are accompanied by gas and oil fumes. When the furnace is open, the crane operating over the area is subject to radiant heat from furnace interiors.

"By installing a Dravo Crane Cab Conditioner on the crane," reports Mr. Harold G. Love, Plant Engineer at Taylor Forge, "we not only eliminated the heat and fumes from the cab, but it is now possible to increase the heat load in this area without worrying as to what its effect might be on the operator, and, ultimately, on production."

With Dravo Crane Cab Conditioners, cab temperatures are maintained at 75 to 85 F. They filter the air, remove dust, dirt and fumes, heat the cab in winter, cool it in summer and provide constant ventilation the year around. They are built in two models: the Self-Contained Unit for installation adjacent to the cab, and the Split-Type Unit for installation in two sections where space limitations prevent the use of the Self-Contained Unit.

Dravo Crane Cab Conditioners are available now and can be installed on any type crane with a minimum of downtime. For more information, write Dravo Corporation, Fifth and Liberty Avenues, Pittsburgh 22, Pennsylvania, or phone your nearest Dravo Office and have a representative call.

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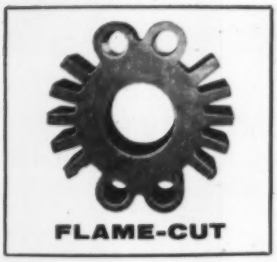

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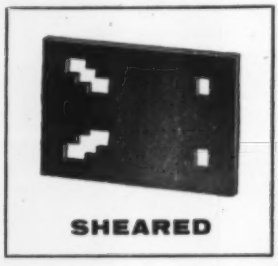

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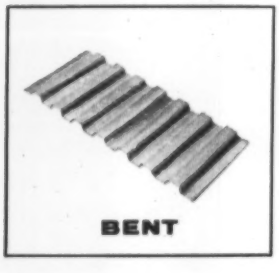

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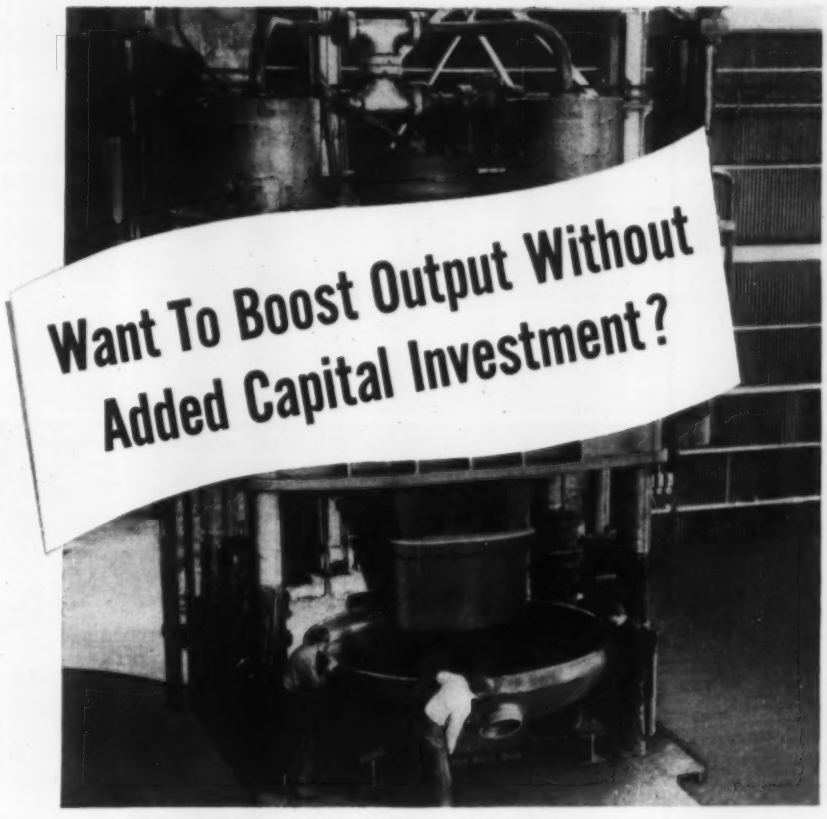

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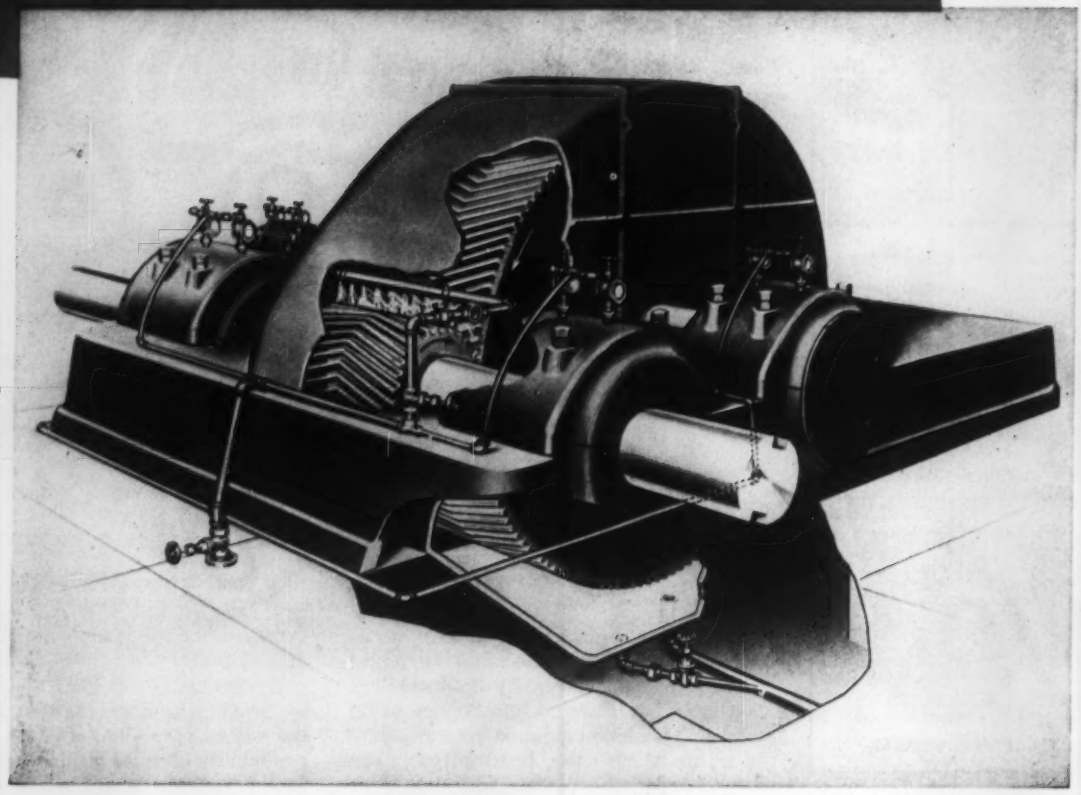

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STEEL
June 13, 1955

Metalworking Outlook

A Matter of Politics

Look for increasing pressure on state legislatures to boost their unemployment compensation (page 65). The Ford settlement calls for supplemental jobless payments to bring state and company payments to 65 per cent of the take-home pay. If state contributions are higher, industry's supplements will be less. Industrial relations men point to the situation in labor pensions as a parallel. As the federal old age payments have risen, the company-paid supplements (really what the "pensions" are) need not be so high.

Unemployment Dips

Sharp unemployment declines are helping labor in its contract negotiations. Unemployment dropped 473,000 from mid-April to mid-May, the deepest April-May plunge in 14 years. Jobless rolls stand at less than 2.5 million. Employment at 62.7 million hit a record May peak.

Where Engineers Go

Here's one reason why there's a shortage of engineers and scientists: In 1939, some 20,000 carried out the nation's $400 million worth of research and development. In 1955, some 175,000 will be needed to carry on $4 billion in research. Currently, 75 per cent of the work is done by industry, 15 per cent by government and 10 per cent by academic or nonprofit institutions. About half the effort is for the civilian economy.

A Tip from Autos

Brown & Sharpe Mfg. Co. is applying assembly line techniques to make automatic screw machines. Result: Units can be assembled in one week, compared with 16 using conventional methods. The company says this is the first time these techniques have been applied to machine tools.

U.S. Investigates Busses

The Justice department's Antitrust division is pushing investigation of complaints that General Motors Corp. monopolizes the manufacture and distribution of busses. GM produces some 70 per cent of all those produced in the country. But the division is not pressing any investigation of GM's position in the auto market—"at least for the present," add government spokesmen.

On an Atomic Basis

Most of the American economy eventually will be on an atomic basis, predicts Dr. John R. Dunning, dean of engineering at Columbia University.

Technical Outlook—p. 107 Market Outlook—p. 169

He points out that our energy consumption is rising faster than our population, so that some day we will have to use atomic power. Six private-enterprise groups are planning major atomic power plants now. So far, $300 million in private funds is going into them.

Utility Spending Soars

Capital spending by utilities will hit $4 billion this year and will climb to nearly $8 billion by 1970. Westinghouse Electric Corp. predicts that in the next ten years, the industry will have to install capacity to produce and distribute an additional 460 billion kw-hr of electricity. "This will call for almost fantastic amounts of heavy electrical apparatus—turbines and generators, transmission lines, substations, power and distribution transformers and many other types of equipment," says Westinghouse's James H. Jewell.

Under the Wire

At last, bills have been introduced in the Senate to extend the Defense Production Act, scheduled to expire June 30. The measure proposed by Sen. J. Allen Frear (Dem., Del.) is a simple extension of the present law. The proposal by Sen. Homer E. Capehart would give the Office of Defense Mobilization authority to develop and "execute" preparedness programs. That means development of stand-by wage and price controls. Many administration officials want that, but are reluctant to ask for it outright. Both bills would extend the act for two years.

More Nickel from Stockpile?

Watch for larger diversions of nickel from the stockpile in the third quarter than in previous periods. The planned speedup in aircraft production will be the basis for the decision due soon from ODM. In the first half, ODM allowed diversion of some 7 million lb of the metal. Industry officials are pointing out that there would be no nickel shortage if it weren't for the big stockpile take.

Straws in the Wind

The administration is supporting H.R. 4983 to provide a general increase in patent fees . . . The Defense department is trying to develop a policy for replacement of outworn machine tools and equipment over a period of five years . . . Westinghouse called upon 3028 different subcontractors and suppliers to help build the atomic engine for the *Nautilus* . . . The U.S. maintains warehouse and storage space which, if spread out on one level in one spot, would cover 31,000 acres—an area twice the size of Manhattan island; the estimated expense to operate those facilities has reached $3.5 billion, nearly as much as the entire federal budget of 1930, says the Hoover commission.

Fact:

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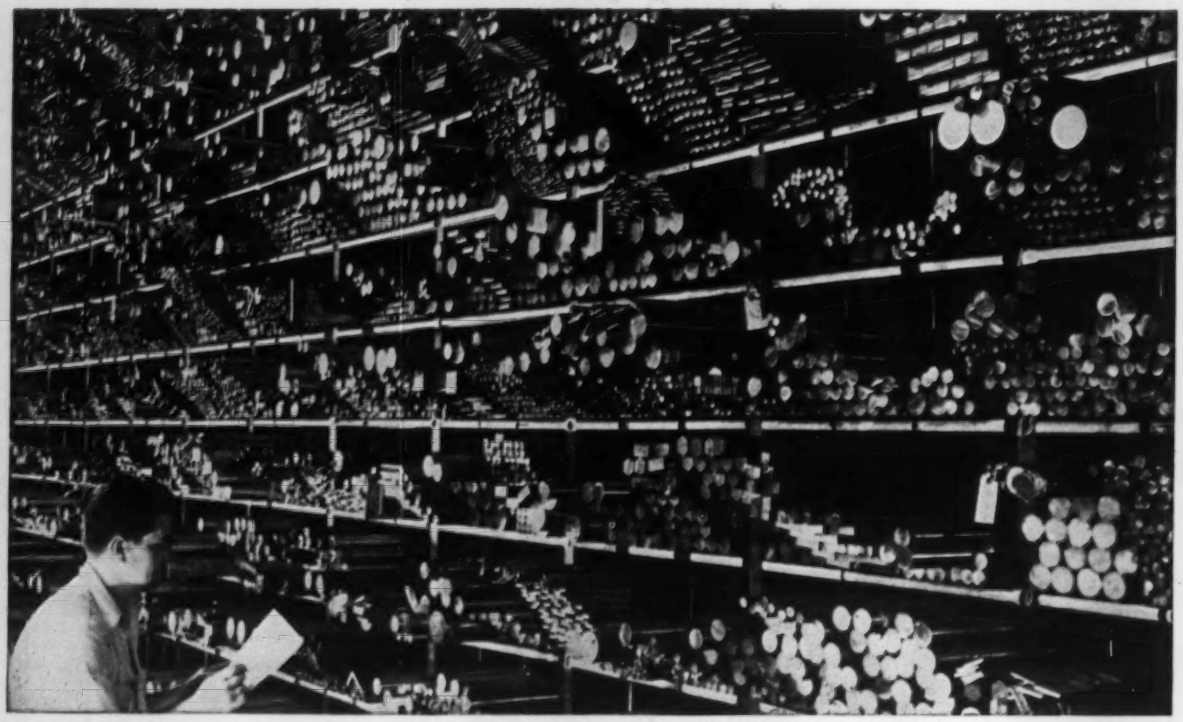

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Get Set for GAW

The contract negotiated in the auto industry opens the way for the application of the guaranteed annual wage, escalator clauses and additional fringe benefits on an industry-wide basis.

With labor getting a bigger chunk of the sales dollar, it will require a complete study and overhaul of employment practices, material specifications, manufacturing methods, product design, cost accounting and pricing, financing and marketing.

The full implications of the guaranteed annual wage with its high costs and obligations struck home last year when President David McDonald of the United Steelworkers' presented his demands to the steel industry. In signing new contracts, both labor and steel management were silent on GAW. It was assumed that labor had decided to delay forcing its demands until some of the ups and downs in production could be ironed out of the large consuming industries.

In the auto industry, Walter Reuther has won a supplementary unemployment compensation, not a full guaranteed wage plan. But he has achieved the opening wedge that could lead to a full GAW in the immediate years ahead.

In labor's GAW timetable, you can be sure that the big industries and the big companies will come first. It may be a long time before GAW reaches the smaller ones.

For years there have been plans here and there in industry for stabilizing production and guaranteeing minimum income to hourly workers. The isolated plans were stepping stones.

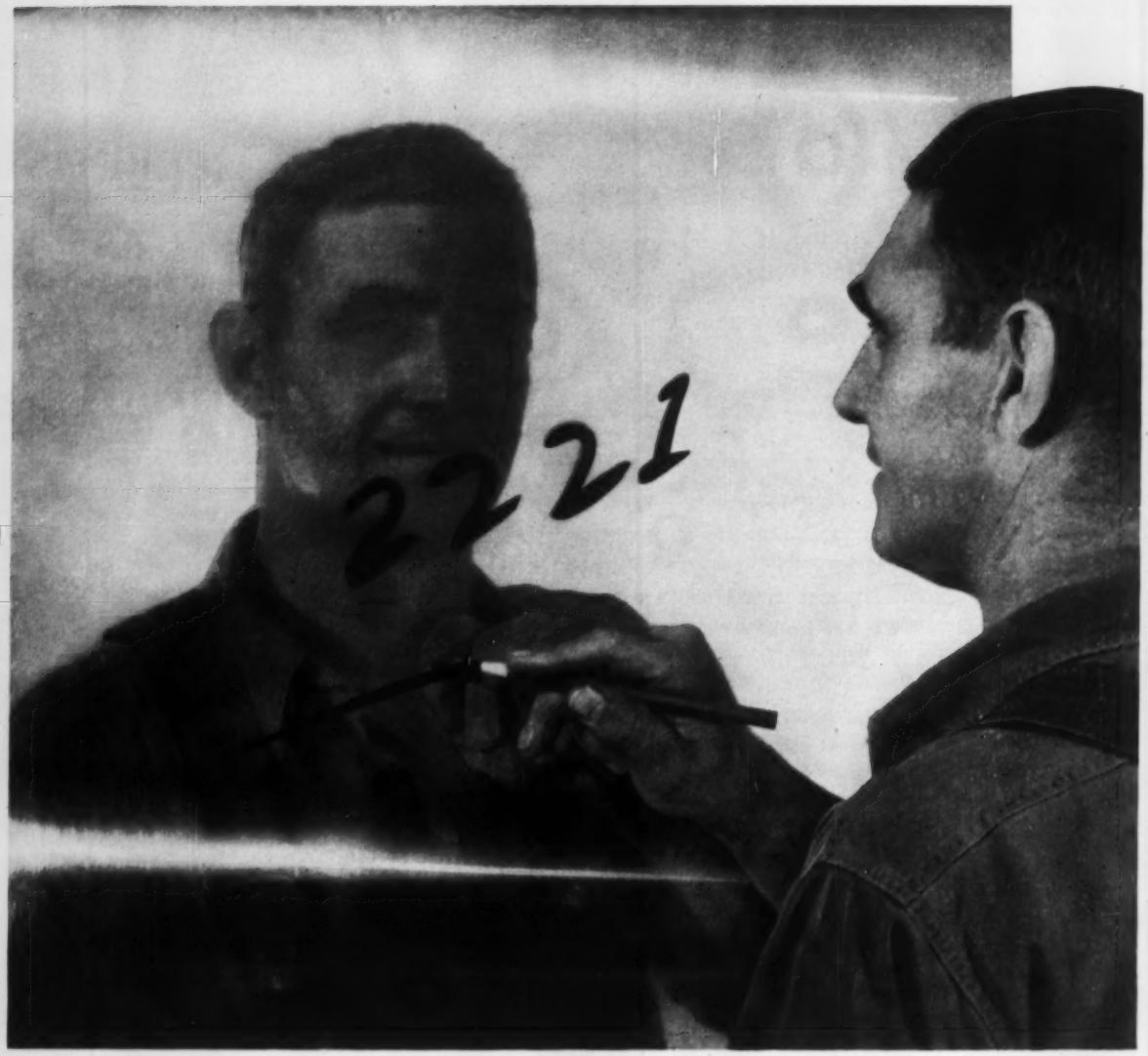
More recently, the pressures for further social progress have been mounting. Management has been receptive to group insurance, paid vacations, liberalized pensions and other fringe benefits contributing to the welfare of employees. Some improvements have been volunteered by management in the awareness that employees need greater security, more leisure time and still higher standards of living. Many have been dictated by labor.

Only businesses with resourceful and imaginative management can hope to meet the challenges posed by the guaranteed wage.

Start planning now.

Irwin H. Such

EDITOR



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How Ford's Three-Year Contract Shapes Up

1. A supplemental unemployment benefit plan, combined with state unemployment insurance, brings a worker's income up to a maximum of 65 per cent of weekly take-home pay for the first four weeks of layoff following a waiting week. It goes up to 60 per cent for the next 22 weeks. The total period for which the company is liable is 26 weeks.

Ford will finance its unemployment compensation plan by contributing 5 cents an hour per worker to two separate trust funds. Based on present employment levels, the reserve fund could amount to $55 million. To allow time for it to be built up, no payments will be made before June 1, 1956. After the fund reaches 39 per cent of its total value, workers will be guaranteed up to 65 per cent of their normal take-home pay for the full 26 weeks. Higher payments will be made in states which have low unemployment benefits, so that all workers will have the same guarantee.

2. Starting June 1, 1955, an annual improvement factor of 2½-per cent of base pay or 6 cents an hour, whichever is greater, will go into effect.

3. Wage increases of from 6 to 17 cents an hour will be paid to workers in certain skilled classifications.

4. There will be a 17 per cent improvement in the cost-of-living program. The allowance will go up 1 cent every time the cost-of-living index rises one-half point, when the allowance is higher than 6 cents an hour.

5. Maximum retirement benefits will be increased from $161 a month, including present primary social security, to $188.50 for an employee with 40 years of service. Benefits also will be increased for the 10,000 retired workers now on Ford's books.

6. Employees with 10 to 15 years of service will be entitled to two and one-half week vacations with pay each year. Employees in this seniority classification previously were entitled to only two week vacations. Fifteen-year employees get three weeks.

7. Employees will have a seventh paid holiday in the form of a half-holiday on Christmas Eve and New Year's Eve. Regular pay, plus double time (in effect, triple wages), will be paid to any worker who has to work on any holiday specified in the agreement.

8. Seven improvements have been made in the company's insurance plan. The most significant inclusion of eligible employees' wives and dependent children in the in-hospital medical benefits.

Ford Settlement: GAW Traded for SUP

WHAT DOES THE settlement with Ford Motor Co. mean?

From a business standpoint, it promises continuing good volume throughout metalworking for the rest of the year (see page 83).

From a long-term labor relations standpoint, it means a logical extension of principles already established, not capitulation by management (see page 66).

From the standpoint of labor negotiations remaining in 1955, it means that unions will want more money than they have been willing to settle for thus far this year.

From the standpoint of politics, it will mean greater pressure on states to boost their unemployment compensation payments. That would minimize the cost to industry, just as the cost of pensions has been cut by higher U. S. old-age benefits.

SUP, Not GAW—No matter what Walter Reuther says, the Ford settlement was for the supplemental unemployment payments, SUP, not GAW. But it will revive negotiating talk for the rest of the year about layoff wages. In 1955 it's unlikely that any will be provided in important industries outside autos. But in 1956, the issue will be paramount, particularly in steel.

Mr. Reuther estimates the cost of the Ford package exceeds 20 cents per hour per worker. Six cent boosts like the ones emerging from recent settlements will look indifferent to workers.

Competition—So, in steel talks which began last week, Steelworker President David J. McDonald will hold out for at least 20 cents. So will other labor leaders.

Steel management may try to get terms down to the 6-to-10-cent level by introducing SUP itself. Steelmen might agree to accept SUP in principle this year and promise to do something about it next. Its price for such a concession: A reasonable wage agreement.

A significant departure—John Bugas, Ford

GAW: A Toothless Dragon?

By FLOYD G. LAWRENCE
Detroit Editor

WALTER REUTHER'S problems are just beginning.

As predicted in STEEL, Jan. 3, p. 123, for sound competitive reasons Ford Motor Co. was the target. As predicted, Ford signed without a strike. There is no doubt that, with minor fringe skirmishes, the principle involved in the Ford contract will prevail throughout the auto industry.

About Face—Mr. Reuther's problem is to convince the workers he represents that the supplementary unemployment payment fund negotiated is actually a "Guaranteed Annual Wage." And as if that weren't enough, he must then convince the legislatures of all but two states in the union that UAW-CIO workers are an exception to the general laws that outside compensation disqualifies a worker from unemployment compensation eligibility.

The agreement just signed is historic, not only because it is the largest package ever achieved but also because it is the first subject to ratification by 46 state legislatures which cannot be negotiated with.

Responsibility—Not even the principle of management responsibility for employee layoffs can be claimed by Mr. Reuther. It was established with unemployment compensation funding many years ago. Mr. Reuther, at best, can only be credited with advancing the coverage already established to a higher level and partially eliminating the middleman, the state eligibility board.

To management men who wonder why Ford conceded even on supplementary unemployment payments without a strike, a fundamental point must be clarified. The issue of the Guaranteed Annual Wage never has been a labor-management dispute. Rather, it has been a pressure between companies competing in the auto industry.

Sell a Man—To quote from the Jan. 3 story in STEEL: "When a firm is in an all-out competitive battle for a given market, a loss in production over a period of any length is a severe setback. Sell a man a Ford today and chances are he'll be back in two or three years for another one. . .

"Against this loss of production, Ford knows that, if granted, the guaranteed annual wage in what form it may take would be at last analysis a cost penalty. Labor in some degree would become an item of fixed overhead. And it knows that any settlement it makes must either be met by General Motors or GM will suffer the shutdown. . . over the longer pull both GM and Ford realize that additional cost would be passed along to the consumer."

Who Pays?—Those two paragraphs not only anticipated the settlement but also largely indicate what is to come.

The public will pay for Mr. Reuther's so-called "Guaranteed Annual Wage." Costs cannot be accurately determined because automakers never release their cost breakdown, but if labor is 50 per cent of the cost of a car retailing for $2000, and if Mr. Reuther's estimate of the package cost at 20 cents is accurate, the hike to the consumer would be in the neighborhood of $60 per car.

Opportunity—Why must it be passed on? Certainly, absorbing that cost would give the larger companies a competitive advantage over the smaller firms. Larger firms always have had the opportunity to do that. Expansion and the fact that the corporations are owned by stockholders have worked against such a contingency. Competitive costs but not cost absorption have been the rule.

There is no reason to presume this reasoning will not prevail in the present cost situation. Why, then, might not Ford—privately owned—absorb the cost to under-

An historic first step—Walter Reuther, UAW

price GM? First, because Ford is only midstream in its current expansion program and needs profits to continue its bid for increased capacity. Second, and less fundamental, is the fact that Ford stock will be going on sale in the fall, and the firm must anticipate close scrutiny of its operations by stockholders who will expect growth, not entrenchment, to assure growing profits.

Pass Alongs—All the automakers, because they see modernization of facilities and expansion as the keys to survival cannot cut into their profit by absorbing costs. Those costs must be passed on to the consumer, and once the larger companies do it, all companies can do it with little fear of cutting down their market penetration.

One interesting implication is the fact that the less integrated companies will have to bear less cost in proportion to their purchasing from suppliers. Oustide suppliers probably will not have the package for about two years, the period of time it took for pensions when they were won. Supplier divisions will have the added cost starting now.

Short Gains—That means not only a competitive cost gain for the companies who buy outside, but also a chance for outside suppliers to undercut supplier division prices until some arrangement can be worked out to hit them with the package.

It is improbable that the union will be unaware of this phenomenon when negotiations begin with the remaining companies. Statements such as that of American Motors' E. L. Cushman that "the problems of American Motors and of its employees in 1955 differ so substantially from the problems of GM and Ford that different approaches must be explored" will be listened to. But though the union has been maturing in consideration of contract tailoring where warranted, final settlements will likely differ little from the pattern established.

Experts—With the sound and fury that preceded its coming, the package as it has finally emerged must seem a toothless dragon to many. The cost of the package must not be minimized and stands as a tribute to the effectiveness of the union negotiators.

But the contract is for three years and not for five. The 40-hour call-in guarantee is missing and must be presumed lost. The "Guaranteed Annual Wage" resolves itself to an extension of unemployment compensation coverage whose principle had been long established. The company liability is adequately limited protecting against the possible compounding of demands during sales drops, a time when the company is least able to pay.

Predictable Costs—Those precedent-setting provisions avoid the primary fears that have haunted management men when the Guaranteed Annual Wage was discussed. As in any negotiation, management has accepted a definitely predictable cost increase in its labor. As in any cost increase, the net effect, with the exception noted, is simply an inflationary increase in the price of a commodity. And that is the import of the negotiations. Nothing more, nothing less.

In negotiations it is difficult to determine what was won and what was merely conceded. Perhaps the union exhibited statesmanship in the privacy of the bargaining room by recognizing the possible destructive force implicit in the demand framed in November. Perhaps the Ford negotiators exhibited statesmanship in winning those concessions for management.

Logic—Whatever the implementation, the package bears little resemblance to the ominous pre-negotiation rumblings of the union. Only by the logic of a labor leader can the Guaranteed Annual Wage be said to have been achieved.

There is much to challenge management in the package as finally written, but little to panic industry. Yet for Mr. Reuther, the biggest battles are still ahead.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*

"How Good Is the Money?"

That's the favorite question. Here's how the American Management Association answers any candidate for a job at middle-management level

HE MAKES $11,200 a year. He's 45 and has been on his present job about four years. Unless he's unusually lucky, he's not eligible for overtime pay, bonuses or stock option plans.

That's the profile of an "average" middle-management man, reveals a survey by the American Management Association. It covers more than 3200 executives in about 100 companies.

Titles—The middle-management man might be district sales manager, plant manager, chief cost accountant, office manager, labor relations manager, divisional purchasing agent or chief project engineer. He belongs in one of 111 job levels in marketing, manufacturing, finances and law, industrial relations, purchasing, engineering and research.

Although the average salary is $11,200, there's quite a range between high and low man—two-thirds of those reporting made between $7000 and $14,900 a year. Though salaries vary from job to job, there's little difference between what a plant manager will make in Cleveland and in St. Louis. The average regional or district sales manager makes $12,000, compared with $14,000 for a factory manager or superintendent.

Extras—Only 36 per cent of the executives surveyed get bonuses, and even fewer are eligible for stock purchase plans. However, most are covered by company pension group life insurance and group hospitalization programs. Few are paid for overtime.

And then there are the headaches . . .

Rail Earnings Rise

The nation's railroads foresee a 112 per cent jump in net operating income this year over 1954's, along with a 54 per cent rise in freight volume.

In April net income (after interest and rentals) of 126 major U. S. railroads was $67 million. Income in April, 1954, was $40 million.

Earnings will drop sharply in future years, railroads warn, unless the temporary 15 per cent surcharges (due to expire Dec. 31) added to rates for most commodities are made permanent.

In asking the Interstate Commerce Commission for permanent surcharges, railroads point out that without the increases their rate of return this year would be 1.31 per cent instead of 3.65 per cent. Net operating income this year will be about the same as in 1952 when the ICC approved the increase.

Du Pont Speeds Expansion

This year E. I. du Pont de Nemours & Co. Inc., expects to spend $135 million on new plants. This is $15 million more than was spent in 1954. No new financing for expansion is expected because cash inflow from depreciation charges is about $120 million annually.

Stran-Steel To Be Separate Unit

Stran-Steel Division of Great Lakes Steel Corp., a subsidiary of National Steel Corp., becomes a separate corporate unit of National on July 1. The new unit will be known as Stran-Steel Corp.

Ernest T. Weir, board chairman of National Steel, said the change is being made to co-ordinate Stran-Steel sales, manufacturing and engineering as part of a nation-wide expansion program.

Stran-Steel has plants at Detroit and Terre Haute, Ind. The company makes pre-engineered, prefabricated steel buildings. It developed the quonset building.

Licensing Regulations Coming

The Atomic Energy Commission is working on nine additional regulations which will help govern the licensing of materials, production facilities and restricted data to industry. This program is designed

Gas-Tight Plastic Tent Aids Titanium Welding

Solar Aircraft Co.'s plant at Des Moines, Iowa, uses an ingenious technique for the fusion welding of large titanium components. A gas-tight zippered plastic tent is fastened to a standard welding table. Long-sleeved gloves, sealed to the vinyl bag, give the operator freedom of movement. Inside, the atmosphere can be controlled for perfect welds. Otherwise, molten titanium absorbs gases, such as oxygen, nitrogen and hydrogen, that make welds brittle

to interest industry in the development of atomic energy for peacetime uses. Harold L. Price, director of industry licensing, AEC, reports: "These regulations should unlock the gates to information necessary to the growth of a new industry." Three proposed regulations were issued by AEC during April (see STEEL, Apr. 25, p. 58).

New Look for Renegotiation?

There's a possibility that the Renegotiation Act, now before the Senate Finance Committee for a two-year extension, may be amended to exempt contracts let as a result of competitive bidding where the procurement agencies have advertised for bids. During questioning, Harold E. Talbott, secretary of the Air Force, remarked that competitive bidding was used for about 40 per cent of all contracts.

Mr. Talbott also pointed out that Defense department expenditures subject to renegotiation in fiscal 1955 and the following two years would run at about $17.5 billion each year.

Frank L. Roberts, chairman of the Renegotiation board, proposed a second amendment to the act. It would extend the standard commercial articles exemption to standard commercial services.

Vance Heads Titanium Project

A titanium research-production co-ordinating project is in the works. Harold S. Vance, chairman, executive board, Studebaker-Packard Corp., is at the helm. Aim of the program is to tie research and production of titanium closer together to improve the quality of the metal and to iron out fabricating problems.

The need for a central co-ordinator was pointed by a Senate Armed Services Stockpile Subcommittee, which said the government has taken on "substantial risks in obtaining heavy production of a product not yet commercially acceptable."

The subcommittee recommended: More complete knowledge by the government of the cost of producing the metal; more money for research on improving the metal, less for stockpiling; postponement of additional government-financed titanium sponge capacity.

Gearmakers Mesh

They expect 1955 volume to exceed 1953 levels. The Ford settlement should help

GEARMAKERS will enjoy a substantially higher volume in 1955.

New orders so far are running 7 per cent higher than in the comparable period of 1954.

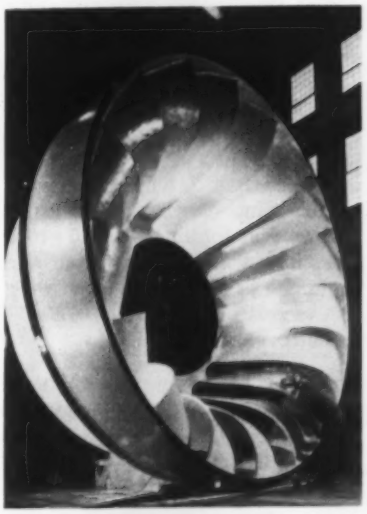
Peak?—Many companies expect their 1955 volume will exceed that of 1953, which generally was a good year for gearmakers. Bookings have been showing a steady month-to-month increase, and the volume is larger than most in the industry anticipated at the beginning of the year.

That is the consensus of members attending the American Gear Manufacturers Association meeting at the Homestead, Hot Springs, Va.

Strength—The demand for gears is especially strong from metalworking users. Although some business has subsided, it still accounts for a substantial volume, particularly from aircraft and shipbuilding.

Gearmakers are looking forward to continued higher industrial production over the rest of the year. That feeling is encouraged by the Ford-UAW settlement which promises freedom from interruptions by major strikes.

Marvin R. Anderson, executive vice president, Michigan Tool Co., Detroit, is the new AGMA president, succeeding R. B. Holmes, general manager, Link-Belt Co., Philadelphia.



Cast Steel: 60 Tons

Before installation in a 57,500-hp, 112-ft head hydraulic turbine, this Francis runner is checked in Allis-Chalmers Mfg. Co. shops. Eight of the turbines go to the Ft. Randall Dam near Pickstown, S. Dak. The 85.7-rpm turbines will draw water through 22-ft-diameter inlets from the 6.3-million-acre-ft Ft. Randall Reservoir

GM's May Sales Set Record

Sales of 354,556 new cars in May set a record for General Motors Corp. The figure is 38 per cent ahead of a year ago's.

All General Motors divisions report record new car sales for the first five months of this year. Deliveries were a record 1,597,653 units, 34 per cent ahead of the previous high in 1950; 41 per cent over the number sold in the like 1954 period.

In the last ten days of May, sales slipped slightly to 120,278 units, 3 per cent below the 123,661 cars sold in the second ten days of the month.

Soft Coal Production Rises

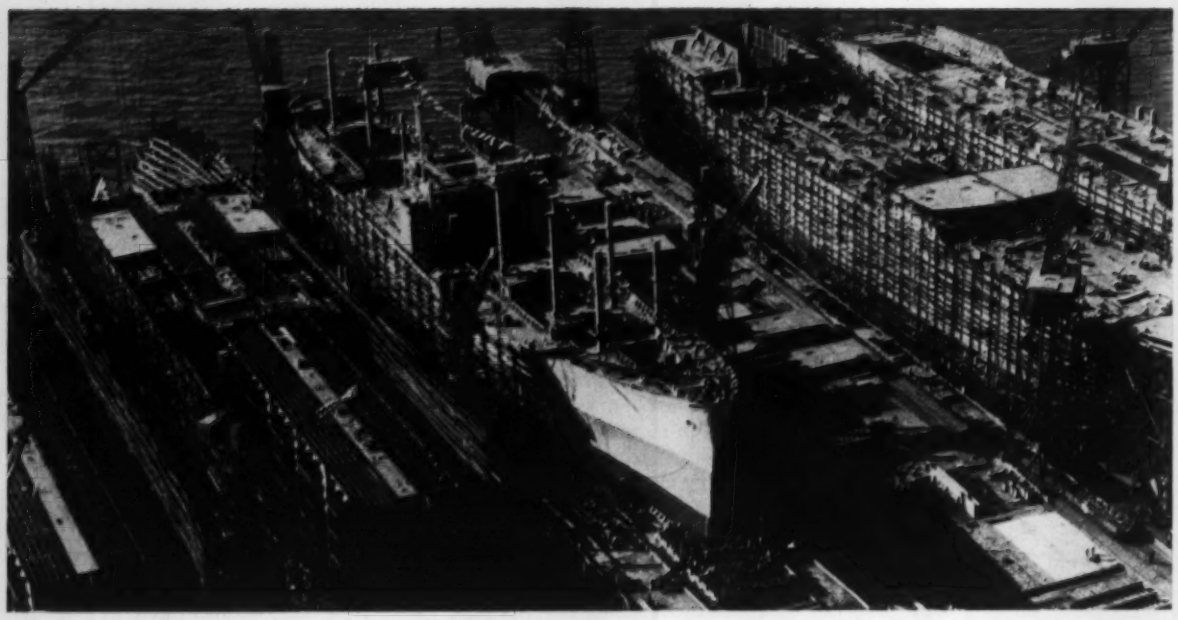
The highest level in 19 months was reached by soft coal production in the week ending May 28. Output was estimated by the National Coal Association at 9,325,000 net tons.

Through May 28, soft coal output has outpaced 1954 by more than 17 per cent. Factors in the strong demand are the steel and electric utility industries and higher export shipments.

Production still is far behind the early postwar years; the industry avers the pace is 20 per cent below that needed to maintain its capacity for defense needs.

Republic Expanding Plant

Republic Steel Corp., Cleveland, is building a block of four soaking pits at its Buffalo plant. They will be used to heat steel ingots to a temperature at which they can be rolled in the blooming mill and will have the effect of adding another "heat" of steel to production each day. Each pit will handle 14 ingots weighing about 6 tons each. The new block will about double the capacity of the No. 7 block it will replace.



Outlook is improving for Sparrows Point Shipyard, says Bethlehem Steel Co.

Calmer Waters Lie Ahead for U. S. Shipbuilding

SHIPBUILDERS are hopefully dusting off their "Out To Launch" signs.

Fairly substantial ship construction lies ahead, believes Leigh Russell Sanford, president, Shipbuilders Council of America — "sufficiently substantial to warrant a hope that it is the commencement of that long-sought-for-but-heretofore-elusive long-range ship construction program."

Caution—But, he adds, the shipbuilders' principal concern at present is the time element. "It seems to be characteristic of ship construction programs," he observes, "that just when they appear to be imminent, they recede into the future for one reason or another."

That attitude of cautious optimism is typical of leaders in the industry, which has been hard hit by low shipbuilding activity.

Just 15—Private seaboard shipyards have contracts for only 15 merchant vessels, aggregating 223,760 gross tons. So far this year only four ships have been placed—three tankers and one ore carrier. That's a gain, tonnagewise, since Jan. 1, when there were 15 merchant vessels of 1000 gross tons or over totaling 210,316 gross tons, but a sharp drop from the beginning of 1954 when there were 48 vessels aggregating 671,837 gross tons.

Value of Unfinished Work in Private Seaboard Yards*

(in millions)

	COMMERCIAL	NAVY	TOTAL
1955	$100	$596	$696
1954	230	362	592
1953	476	615	1,091
1952	544	428	972
1951	111	108	219

* Jan. 1 each year.
Source: Shipbuilders Council of America.

Private yards active along the seaboard are not operating at more than 10 to 20 per cent of their combined capacities. Were it not for Navywork the plight of these yards would be worse than it is. More Navy construction was under way in private yards at the beginning of this year than merchant work—302,840 tons on a displacement basis, compared with 210,316 tons on a gross basis for merchant.

Some Relief—Ship repairing also has lagged. The emergency ship repair program authorized by the last Congress has provided some relief as has Navywork. But in the final analysis, ship repairing is dependent largely upon the volume of American-flag shipping, which leaves much to be desired.

Shipyard employment was off 20 per cent last year, winding up with 67,135 for the fourth quarter. This downtrend is slowing up and perhaps leveling off. But few shipbuilders anticipate any marked reverse in employment before the fourth quarter. Even if fairly substantial work is placed over the near future, there will be a lag before it is reflected in important degree in shipyard employment.

Hanging Fire—While there has

been enabling legislation by Congress, there have been delays in placing contracts and starting work authorized because of complications in interpreting the legislation, shipbuilders declare. That particularly has been true of the Military Sea Transportation Service program, which calls for construction of a number of special-type privately owned tankers to be chartered to MSTS for ten years. The program has been hanging fire for nearly a year, but now it appears fairly imminent, involving upward of 14 tankers.

The trade-in-and-build program, which shipbuilders have also relied on to tide them over till other authorized construction gets under way, got off to a slow start, with four vessels placed to date. However, there are applications for at least five more.

Bidding Soon — Prospects also are brightened by the likelihood that bids will be asked soon on several prototype ships as a part of the Maritime Administration program. Bids may be taken on these vessels over the next two or three months. Moore-McCormack Lines are expected to ask bids July 12 on two liners. Grace Line may enter the market for two later in the year.

The Navy program for the fiscal year beginning July 1 calls for one aircraft carrier, 13 destroyers, two destroyer escorts, three auxiliary ships and a number of submarines. Bids are expected to be taken between now and fall. Private yards are hopeful of participating in the work; even the large carrier wouldn't be beyond the capability of some of them.

In any event, shipbuilders are looking forward hopefully to an upturn in their business before the year advances much further. Meanwhile, certain leaders are planning for the more distant future—and nuclear power merchant ships.

Fast Write-Offs Speed Up

Between May 5-18, the Office of Defense Mobilization granted 50 new certificates of accelerated tax amortization. Total value of the facilities approaches $50 million.

Power generating and titanium plants head the list. Indianapolis Power & Light Co., Centerton, Ind., was granted 65 per cent on a $14.3-million plant. California Electric Power Co., Highgrove, Calif., got 30 per cent on a $5.2-million plant. Columbia-Southern Chemical Corp., Natrium, W. Va., was allowed 90 per cent on its $5.5-million outlay for producing titanium metal. The grants bring ODM's total tax concessions to more than $30 billion.

What People Think About the Steel Industry

(all figures in per cent)

	Public Opinion			Steelworker Opinion		
	1955	1946	1943	1955	1946	1943
Best working conditions	19	6	6	47	19	25
Steadiest employment	15	7	8	47	21	33
Most friendly to employees	7	2	*	34	10	*
Highest average hourly rate	32	*	17	38	*	25

*Question not asked.

Source: American Iron & Steel Institute.

Steel: Popularity Grows

SOUND public and employee relations programs are paying off for steelmakers. A third series of opinion - research studies (see chart) conducted for the American Iron & Steel Institute points out that the public and the steelworker are recognizing: 1. The essentiality of the steel industry. 2. The highness of its wage scale. 3. The progress being made by all steelmakers.

How — The opinion - research study is based on 3586 personal interviews with the public, steelworkers, community leaders, clergymen, school teachers and college professors.

Biggest criticisms registered by the public are that a steel mill is a "dangerous place to work" and that the industry has too many "labor troubles." There was an appreciation of the fact that danger is somewhat inherent in steel operations and half of the public and two-thirds of the steelworkers say that the accident rate, so far as they know, is lower or about the same as in other industries.

Good Omen — Steelworkers and community leaders in steel-producing areas show greater acceptance of steel as a neighbor than groups that have no steelmaking facilities in the community.

Some 45 per cent of those interviewed acknowledged that steelworkers make at least $10 more a week than other manufacturing workers.

When asked which was the most essential industry in the U.S., 57 per cent of the interviewees replied steel; 31 per cent, automobiles; 28 per cent, food; 25 per cent, rails; 19 per cent, oil; 10 per cent, lumber; and 6 per cent, rubber.

BDSA Seeks 'Trigger' Tools

A STAND-BY pool order program which can be "triggered" immediately in the event of war is under way. It will rely on lessons learned during World War II and the Korean War to streamline its operating methods.

Initial Step—The Metalworking Equipment Division, Business & Defense Services Administration, is soliciting recommendations from the machine tool builders on procedures and contract arrangements —they should be in within the next two weeks. Representatives of BDSA, Department of Defense, General Services Administration and Office of Defense Mobilization will discuss them.

Method—BDSA is hoping that the government and contractors involved will be able to sit down this summer and work out a contract agreement. Then the contracts would be let to the manufacturers on a stand-by or "trigger" basis (orders would go into effect automatically in case of war). Theoretically, the manufacturer will have most of the necessary tooling, personnel and equipment to handle the contract assigned. If he doesn't, it would give the government time to see that he does get what is needed.

By allowing the manufacturer to have a contract on file, BDSA feels sure costly delays would be avoided. Bargaining and negotiating would be out of the way.

If the Metalworking Equipment Division gets its recommendations through, the contracts will be surveyed periodically (every six or nine months) to insure that the product or component called for still is necessary to the defense structure.

Tools: More Orders?

■ BDSA has submitted a critical machine tool survey and another elephant tool program to ODM. The new elephant tool program calls for expenditure of $72 million; the machine tool survey states that to bring the U.S. to a state of "total preparedness," some $1.8 billion would have to be spent.

Look for ODM to fire both reports back to BDSA for clarification and reworking. It appears that there is much duplication and overlapping with programs now going or soon to be started. There also is a question as to what is the "real difference" between defense-supporting industrial requirements and military requirements.

Reports Stir Comment

■ Rep. Chet Holifield (Dem., Calif.) states that the Hoover Commission on Government Reorganization is overstepping itself by acting as a judge of basic government policies.

The commission, headed by former President Herbert Hoover, has been running into considerable opposition from congressmen each time a report is issued. There are nine to go.

Addressing a meeting of the Society of Business Magazine Editors in Washington, Sen. Harry F. Byrd (Dem., Va.) stated that the Hoover Commission reports are a step in the right direction. He said that nothing will be done in this session of Congress on any of the reports and that the President will have to give strong backing to each one in the coming session before any action will be taken. Senator Byrd admitted that the commission may be a bit optimistic on how much can be saved.

Note on Security

■ A Senate subcommittee has voted unanimously for the creation of a bipartisan commission to investigate the Federal Security System.

Three Republicans joined four Democrats in the voting which will send the plan before the full Government Operations subcommittee. Sen. Harry P. Cain (Rep., Wash.) states: "This is a tremendous step in the direction of preserving freedom in this country."

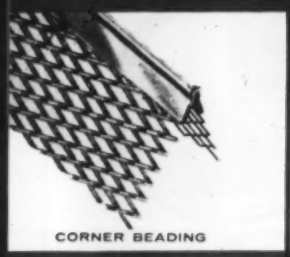
If approved, the commission would be instructed to end what Democrats introducing the idea term "the abuses and contradiction in programs affecting some 10 million federal and defense personnel." Thus far, top administration officials have turned "deaf ears" to the proposal.

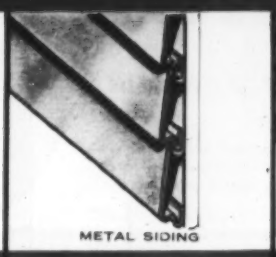
October Symposium Slated

■ Starting Oct. 10, a Joint Military-Industry Symposium on Packaging and Materials Handling will be held in Washington.

New military and industrial developments in materials, methods, procedures and equipment will be described and displayed during the three-day session. The theme: "What is new? What is needed?"

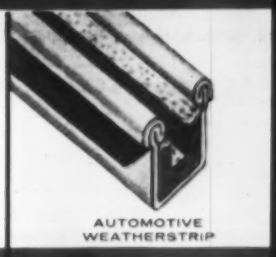
The Shapes of Things to Come

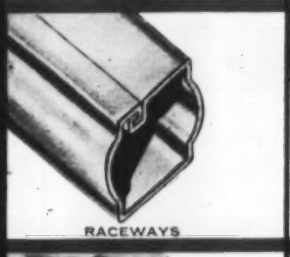

CORNER BEADING


METAL SIDING

METAL DECK—FLUTING

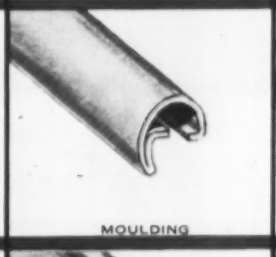
STAINLESS—GALVANIZED TRIM


AUTOMOTIVE WEATHERSTRIP

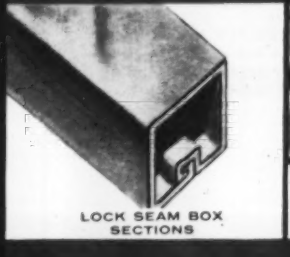

RACEWAYS

LOCK SEAM TUBING

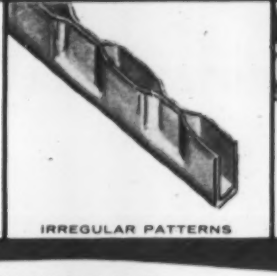
WINDOW SECTIONS


MOULDING

NAILING FLANGES


LOCK SEAM BOX SECTIONS

METAL ROOFING


IRREGULAR PATTERNS

COATED METAL PRICE STRIPS

SHEET and STRIP FLANGING

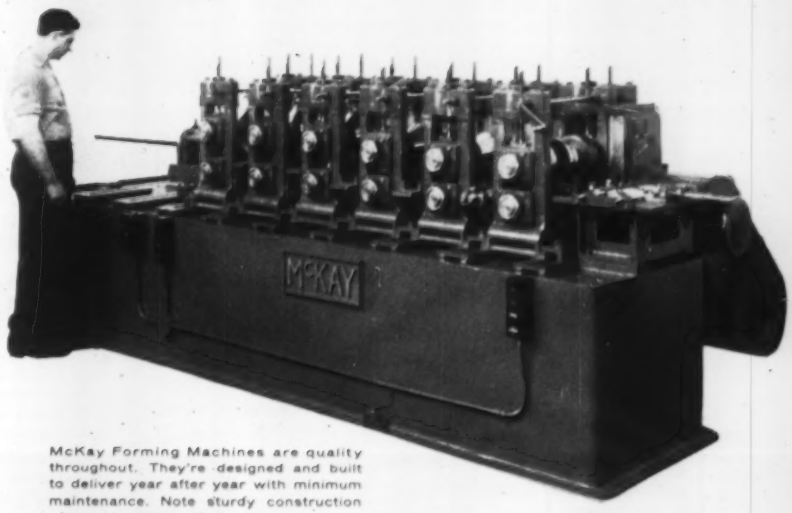
Call for McKAY FORMING MACHINERY

Two words that best describe McKay Forming Machines are "precision" and "ruggedness."

McKay Forming Machines are the last word in quality. They're designed and built to perform with extreme accuracy year after year. McKay users the world over know that quality is never sacrificed, even in the smallest details, for the sake of marketing a "cheaper" unit.

And McKay Forming Machines are built to customers' requirements with an eye to the future. They're machines that will not only meet today's needs, but machines that are ready for the faster speeds, tougher metals and more intricate shapes of tomorrow.

Be sure you have checked with McKay before you order forming equipment. You'll find this unmatched precision and ruggedness pays off in better forming at greatly reduced costs. And with a McKay—you're ready for tomorrow!



McKay Forming Machines are quality throughout. They're designed and built to deliver year after year with minimum maintenance. Note sturdy construction of machine pictured above.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

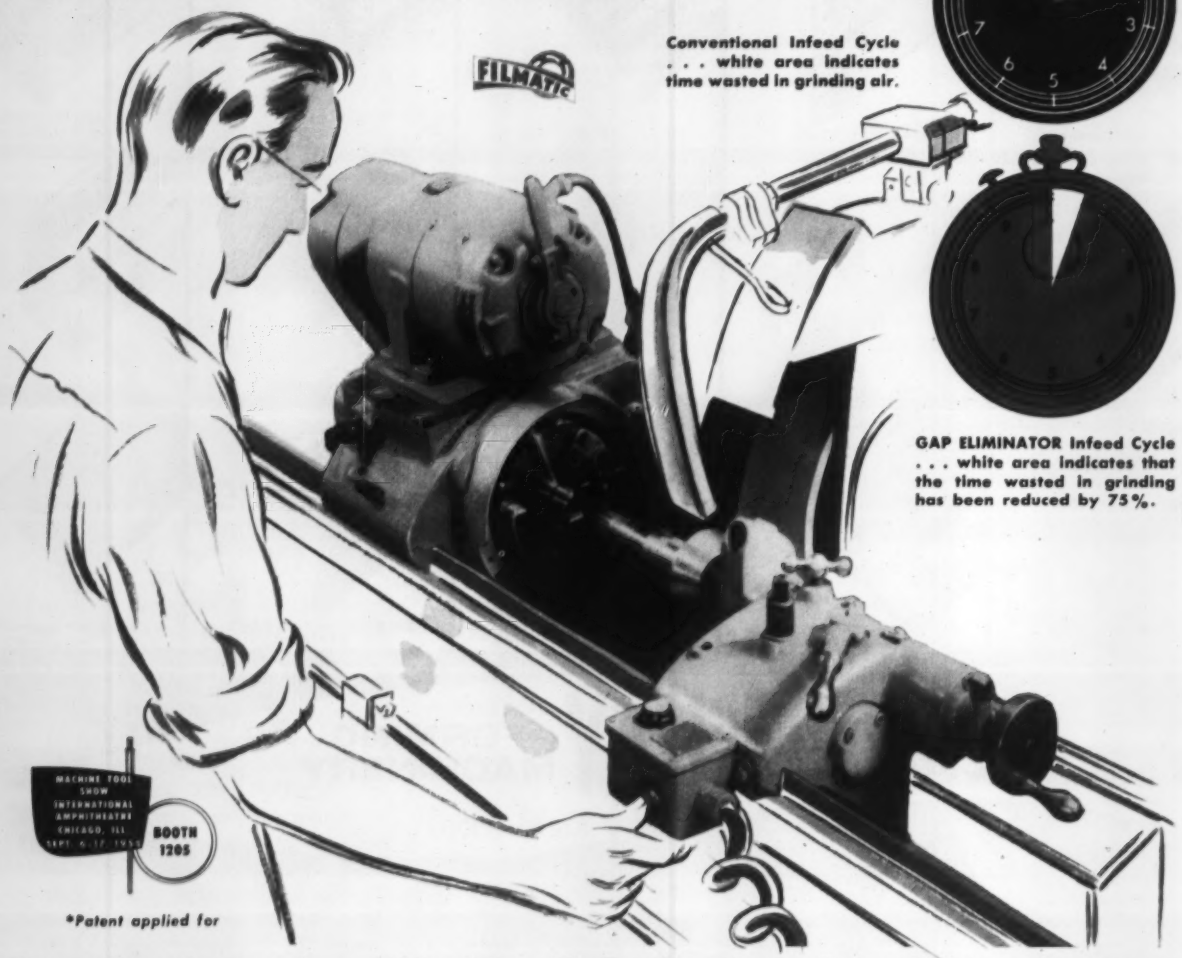
ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

Gap Eliminator*

Gets the Wheel to Work *ahead of Schedule*

Conventional Infeed Cycle . . . white area indicates time wasted in grinding air.

GAP ELIMINATOR Infeed Cycle . . . white area indicates that the time wasted in grinding has been reduced by 75%.



*Patent applied for

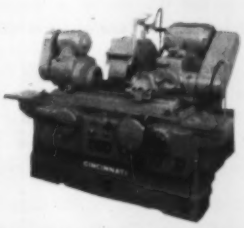
How much time does your shop spend in grinding air? Too much, you can be sure, but it's not the fault of the workmen, for a certain amount of "cutting air" is a necessary evil in many machining operations. ¶ Cincinnati Grinding Engineers decided to do something about the time lost in grinding air during automatic infeed grinding cycles and developed the GAP ELIMINATOR, a new feature which may be built-in at the factory on automatic infeed machines. Briefly, here's how it works:

The wheelhead advances toward the work at a rapid rate. At a predetermined point (grinding stock on radius + .001") the rapid rate changes to a fast feed rate. Instantly upon contact of the wheel and work, the normal grinding rate takes over, and the cycle continues to completion.

For the example illustrated, the resulting saving amounted to 75% of the time spent in grinding air and 25.8% of the total cycle time. ¶ Time savings like this can mean big dollar savings on the cost records. It will pay the management of every metalworking shop concerned with precision grinding to find out more about the GAP ELIMINATOR feature available for CINCINNATI FILMATIC Grinders. Write for literature.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINNATI



GAP ELIMINATOR may be combined with Push-button Automatic Infeed and other cost-reducing features on CINCINNATI FILMATIC Grinding Machines like the 10" x 18" size illustrated above. You can obtain complete information by writing for publications No. G-603 and G-648.

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

Build Your Own Markets—Dave Reynolds

AS YOU DRIVE along the highways this summer, the familiar Burma Shave signs will gleam in aluminum.

It is the latest in a long parade of new applications for the light metal that have been developed since World War II. Like scores of other applications, it attests to the market development ingenuity of David P. Reynolds, vice president, general sales, Reynolds Metals Co.

Building Markets—Reynolds doesn't wait for markets to develop. It develops a product and builds a market for it. That aggressive attitude is one important reason why the aluminum industry has been able to increase its production almost tenfold since 1939.

In 1939, total U. S. aluminum production was 327 million lb. The first year after the war, production was 2½-times greater. In addition, we had some 3 billion lb of aluminum scrap. The industry faced a tremendous sales problem—almost 4 billion lb to sell instead of 300-odd million. The problem seemed not only big but almost impossible. Many people thought it might take a generation for aluminum demand to catch up with war-born capacity.

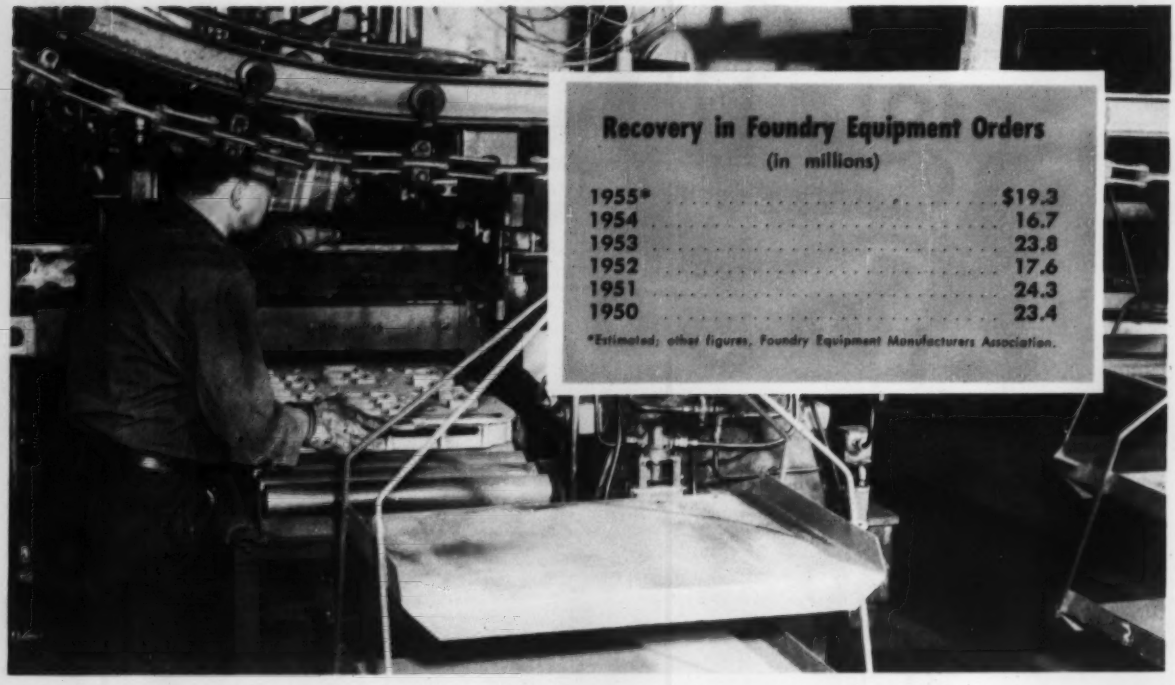
As a result of producers' market development activities, this year's aluminum production will be three times what it was at the end of World War II and ten times what it was in 1939.

Power of Sample — Dave Reynolds believes firmly in the power of the sample. When Reynolds faced up to the job of conditioning the public to use more aluminum, it chose foil as its great demonstrator. The launching of Reynolds Wrap was the largest mass sampling in history. Through the foil, millions of consumers were educated to the versatility of aluminum.

Across-the-Board—While Reynolds Wrap was riding high as the champion, Reynolds was promoting other new uses of aluminum in construction, transportation, chemistry and petroleum, appliances and equipment. Dave Reynolds lists 41 new uses promoted by the company, ranging from bridge railings and utility tubing for oil rigs to wastebaskets and lamp bulb bases.

Do-It-Yourself—The second great demonstrator in the Reynolds campaign, Do-It-Yourself aluminum, came by chance. When the company's general sales office was being remodeled, Dave noticed an elderly carpenter cutting an aluminum extrusion with a wood saw. Dave asked if he weren't ruining it. The carpenter replied he could saw aluminum more easily than a knot in a pine board. That started Dave Reynolds' creative mind working. The result is racks of assorted aluminum for home use in about 15,000 hardware stores.

Every rack is a salesman for Dave Reynolds.



Recovery in Foundry Equipment Orders
(in millions)

1955*	$19.3
1954	16.7
1953	23.8
1952	17.6
1951	24.3
1950	23.4

*Estimated; other figures, Foundry Equipment Manufacturers Association.

Automation, modernization mean sales

Foundry Equipment: Sales Up

HARD SELLING but good business is the prospect for foundry equipment manufacturers. Sales in April were the highest in over a year; estimate is that sales for 1955 will be at least 15 per cent higher than 1954's.

Foundry equipment manufacturers look to automation, replacement and modernization to provide most of their business. Two rounds of foundry expansion have taken place since World War II (in 1946-1948 and during the Korean War).

Here's the Challenge—Manufacturers must design, make and install equipment that can do a better job. More engineering is required on automated machines.

More selling is needed: Often, the sales effort expended now to sell one replacement machine would have sold a dozen during one of the expansion periods.

Foundries are ordering more made-to-order equipment. Both foundries and equipment makers are affected by the trend to automation. Flask sizes are being standardized; more castings and more weight per mold is the rule; and sand spillage is vastly decreased. Complicated controls on automatic machines call for better foundry maintenance personnel. Where an equipment maker once sold a molding machine, he now is called in to design an automated molding system complete with flask handling equipment, a mold closing machine and a mechanical shake-out.

Sales—Prospects for 1955 look good to most equipment makers. Most expect to do better than last year; some expect to come close to their best postwar year. Beardsley & Piper Division, Pettibone Mulliken Corp., Chicago, expects to exceed its previous high. Captive foundries, particularly automotive, are leading the order parade.

The big production surge for 1955 won't get rolling until the second half. As a rule, in the foundry equipment industry shipments lag six months to a year behind orders. Shipments in 1955 probably will be less than in 1954. But the new orders coming in will assure a good level of shipments on into 1956.

Little correlation exists between activity of foundry equipment makers and business as a whole. Ordinarily, an increase in the equipment makers' business precedes an increase in general activity.

The low level of foundry activity in 1954 brought home sharply the need for more cost cutting machinery. But with an uncertain outlook foundries hesitated to buy. Now, with a proved need and an optimistic outlook, equipment makers are out for orders and getting them.

Machinery Sales Up

New orders for metalworking machines were nearly $226 million for the first quarter; first quarter orders last year were about $181 million.

Shipments were estimated at $201 million, down $127 million from a year ago; cancellations averaged about 4 per cent of new orders, compared with 12 per cent in the same period last year.

As of Mar. 31, 1955, unfilled or-

ders showed a marked improvement, approximating $276,507,000. On the basis of average shipments during the first quarter, this represents a 5.6-month backlog.

Tractor Shipments Rise

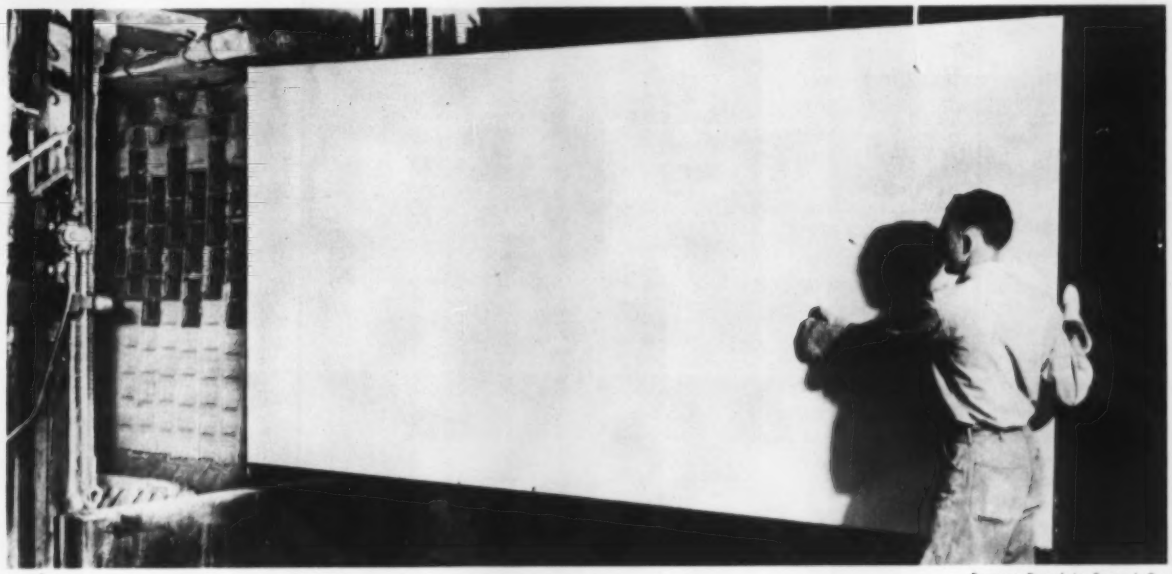
Tracklaying tractor shipments were $76 million in the first quarter, $6 million higher than in the fourth quarter of last year.

First quarter shipments of excavating and earthmoving equipment were valued at $148 million—an 8 per cent increase over shipments in the fourth quarter last year.

Coal Pipeline Planned

"The first commercial coal pipeline in the United States"—that's how George H. Love, president, Pittsburgh Consolidation Coal Co., describes the 108-mile system that will link the coal mining area around Georgetown, O., to Cleveland Electric Illuminating Co.'s plant at Eastlake, O.

Project cost is estimated at between $8 million and $10 million. The contract calls for delivery of about 18 million tons of coal over a 15-year period. Plans are to clean the coal, break it into small pieces and then mix it with water before it enters the pipe. Mr. Love remarks that railroads serving the mine and the utility are co-operating fully, and will share in its ownership.



Barrows Porcelain Enamel Co.

Future Gleams for Porcelain Enamel

YOU CAN GET more business by showing your customers how to use less of your product per unit. That has been the experience of producers of porcelain enamel frit. Their business has more than doubled since 1941. The thickness of enamel required to produce a white finish has dropped 74 per cent in the last 20 years.

Enameling capacity today is over 3½-times what it was in 1940 when an estimated $130 million of enameled products were made, compared to $382 million in 1953. Indications are this figure may go to $488 million by 1960.

New Uses — Porcelain enamel coatings are being applied to aluminum castings and sheets. The coatings make aluminum cooking utensils more decorative. Enameled aluminum sheet was used for bulkheads of two aircraft carriers (now hear this—no painting needed).

Lead-base frits requiring temperatures of about 1000°F are used in enameling on aluminum. Researchers are striving to eliminate the lead from the frit mixture.

Research in applying porcelain enamel to aluminized steel is promising. If successful, porcelain enamel can be applied to steel at 1000°F.

Presently, temperatures of 1500 to 1550°F are used in applying porcelain enamel to steel. Enamelers are striving for lower temperatures—in the range of 1200°F. And enamelers want to eliminate the blue ground coat. Inland Steel Co. produces a titanium steel in limited quantities that does just that.

New Processes — Introduced within the last three years are flow coating, continuous dipping, automatic spraying of specific items and electrostatic spraying. (See story on page 108.)

for the "NEW LOOK" in VERTICAL TURRET LATHES

SEE THE NEW

BULLARD CUT MASTER

Completely redesigned with many exclusive engineering features that make it the *most modern on the market today* including:

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PENDANT CONTROL

Exclusive Bullard design, for maximum machine control from a movable pendant station. Start and stop spindle; selection of speeds, feeds and directional movement of all heads in feed or traverse are quickly and easily accomplished from the Pendant. Interlocks and a stop-all stick provide safety for both operator and machine.

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ELECTRIC CONTROL PANEL

Accessible yet concealed and protected from oil, dust and other foreign matter.

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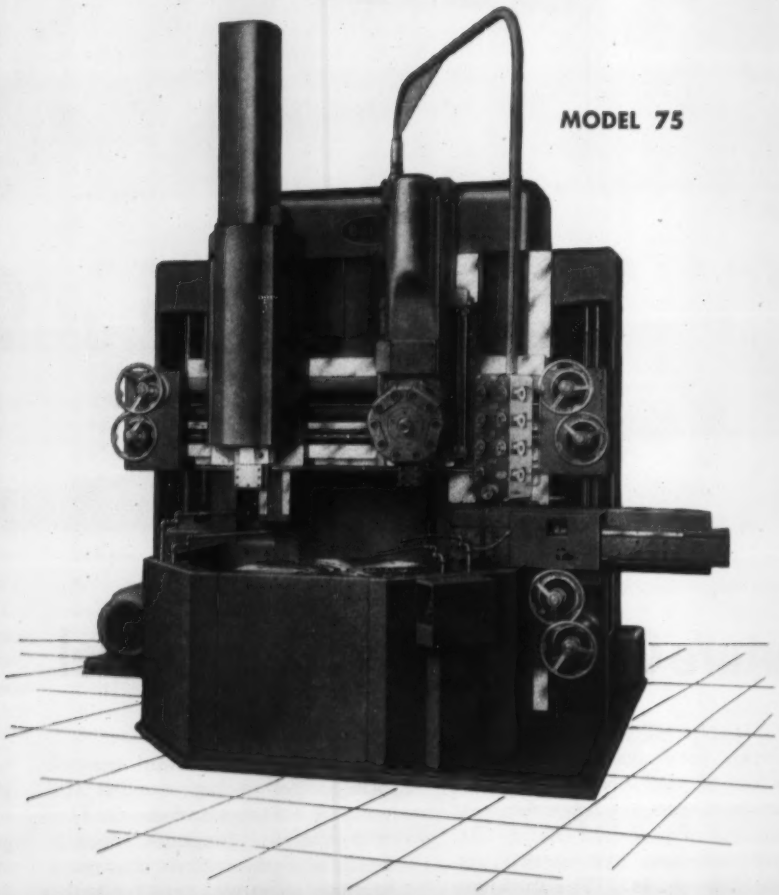
POWER INDEXED MAIN TURRET
(Optional)

Five sided turret for "run of the mill" jobs. Four sided turret for production jobs.

Available in 26, 36, 46, 56, 66 and 76 inch sizes.



MODEL 75

THE BULLARD COMPANY
BRIDGEPORT 2, CONN.

More than 70 lb of light metal in this Chrysler shows . . .

Aluminum Makes Gains in Autos

ALCOA PREDICTS aluminum use in autos by 1970 will rise to 100 lb per average car, compared to 30 lb today.

Automotive use of the light stuff goes back to 1902 or so. It found its zenith, percentagewise, in such customish jobs as the Franklin of the 1920s. This car sported an aluminum body and aluminum functional parts wherever they could be applied feasibly. With its air-cooled engine, the Franklin weighed perhaps one-half as much as comparably priced competitors.

Background—But as the auto industry consolidated into a handful of mass producers with a cost consciousness like a hobo with 12 kids in college, aluminum began to lose out. Not only was the metal output limited then, but the number of experienced fabricating shops also was small. Nor was there the range of alloys and tempers in aluminum that would give the automotive engineers the variety of performance required. It's little wonder the industry turned to ferrous materials where these things were available.

Today, aluminum is beginning to get its light foot back into the door. Its use in aircraft is an important stimulus which has done much to correct the deficiencies encountered in the last couple of decades. Truck and trailer makers also found its properties desirable, as did foreign car builders facing a fuel-conscious market.

Not on Weight Alone—If aluminum had to pay its way as a weight saver in terms of fuel economy in this country, the metal's pushers would be working the teakettle circuit. That's because the estimated 25 per cent saving to an average motorist paying $180 annually for gas amounts to less than $50 a year. Car weights in this country have trended upward since the 1930s, and there's no sign they're immediately heading back down.

But there's another trend that is helping aluminum substantially. That's the desire of Johnny Push-button for more labor-saving gadgets in his car. These gadgets may be controlled from the dash, but they tend to be located in an already cluttered engine compartment, adding weight to an already too-heavy front end. Engineers tend to favor the light stuff up front for this reason alone.

Management would never buy the proposals, however, if aluminum didn't have plenty on the ball in the fabricating and cost departments as well. Then, too, aluminum has fairly well-noised properties other than light weight.

Pistons, for Example—With the matriculation of a couple of holdouts a couple of years ago, aluminum pistons went across the board in the auto industry. The early engines, which were of slow-speed, low-compression design, used cast iron pistons. The advent of the high-speed, high-output engine required not only a lighter piston for reduction of the reciprocating mass, but, more importantly, a greater heat dissipation, so that higher compression ratios could be used. Today, with compression ratios of eight or nine to one, it would get awfully stuffy in combustion chambers without aluminum.

Incidentally, look for more com-

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

panies to use aluminum cylinder heads soon as compression ratios continue to move on up.

And Diecastings—Old stuff even to kindergarteners is the ability of aluminum when it comes to diecastings. Always given a heavy battle by zinc, aluminum is used by some automakers in such parts as complex carburetor housings, fuel pump housings, hydraulic power steering gear housings, etc. Another direct competitor, magnesium, offers suitable properties but loses out on price in present circumstances.

One of the outstanding uses of aluminum currently is in automatic transmissions which for some manufacturers encompasses everything but the gears, shafts and clutches. Here the precision casting of aluminum and excellence of surface finish obtainable is perhaps best brought out in the torque converter of the Packard Ultramatic transmission. Owing to the nature of the vanes of the torque converter, casting by conventional means is impossible.

How It's Done—To make the part, individual cores are produced of plaster and assembled. Because a small variation can be serious when as many as 30 or more cores are involved, a technique was worked out by which tolerance limits of the cores are held to plus or minus 0.0005 in. This same dimensional accuracy represents the attainment of extremely close dimensional tolerances on the finished parts, as well as smooth surface finishes, so the part requires a minimum of machining.

Other torque converters have extruded blades, a process to which aluminum also is well adapted. Use of aluminum extrusions in the auto industry is growing where they can compete with metals like rolled stainless and low carbon material. One notable example in the decorative-functional field is the upper door section on American Motors Corp. products. Extruded with such mechanical inclusions as the window channel and drip rail, the part is readily formed into shape and adds a decorative touch to the door.

Chrysler Leads—Chrysler Corp. also uses extruded shapes for such parts as the front seat cushion frame moldings. Cars like the New Yorker equipped with power steering and Powerflite transmission contain well over 100 types of aluminum parts which weigh over 70 lb. A hypothetical Chrysler Corp. composite car, composed of the Plymouth, Dodge, DeSoto, Chrysler and Imperial, would contain 70 lb of aluminum, reportedly double that in any other make. This 70-lb figure compares with 64 lb in a similar composite in 1954 and is indicative of the growth in the use of aluminum.

The Chrysler Engineering Division has a special staff assigned to concentrate on applications of aluminum. They report that the trend is definitely for further increases in its use of aluminum, particularly in the functional parts field. Other manufacturers, however, are reported considering substantial uses in the functional-decorative field, such as anodized dash panels with matching interior moldings. The use of aluminum in such parts as the roof panel of the Cadillac dream car, the El Dorado Brougham, has met warm public response. The metal may creep in (because of its resemblance to aircraft) as symbols of speed.

Other Aids—Other developments like the process for plating chrome directly on aluminum, improvement in aluminum soldering materials and brazing techniques could open the doors to use of aluminum in radiators, exterior trim and wiring. The Nash Rambler models, for example, already using aluminum radiators, utilize aluminum battery cables in preference to the more expensive copper. Field reports indicate no service difficulty.

According to a survey just completed by Aluminum Co. of America, use in 1955 is at a high of 30 lb per car. Over 178 million lb will be consumed if 6 million cars are produced, about 5 per cent of the industry's output. While most of this is going into engine and transmission components, Alcoa believes that the trim and hardware field offers the most promise for growth during the next few years.

More Growth—That still leaves a considerable gap between the over 400 lb of aluminum considered feasible by some aluminum makers and the 70 lb of aluminum currently used in leading consumer Chrysler products. Then, too, one major reason the consumption is up this year is the swing to V-8 engines—this means two more pistons per engine. Even that 1½ lb per car mounts up to a heady total when spread through the industry.

In a way that exemplifies what the aluminum makers have at stake. For if 1¼ lb could be added to every car built by the industry, that would add up to about 9 million pounds of the very light metal.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	912,791†	621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,010

Week Ended	1955	1954
May 7	215,756	154,640
May 14	221,746	153,796
May 21	221,936	157,993
May 28	209,939	148,733
June 4	166,146†	119,688
June 11	175,000*	139,312

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

One of the most unusual bits of bravado on production comes from Oldsmobile which reports: "Only in 1949, 1950, 1951, 1953 and 1954 have Oldsmobile sales exceeded the 241,374 new cars delivered from January 1 through May 20, 1955."

The new Plymouth Suburban station wagon contains almost 20 lb of plastic, nearly twice as much as most cars. The reason: A new single-piece plastic headlining of rubber resin alloy fastened into position with screws and removable as a single piece. Almost indestructible, the unit should find growing use in the industry as lower roofs demand more contour in head linings for noggin clearance.

THE STEEL THAT CHANGED A FAMOUS AMERICAN EXPRESSION

GET THE LEAD ~~OUT~~ IN!

● Top management's most pressing problem today is quantity production of quality work at highly competitive prices. The answer to this problem is productivity.

Many manufacturers are turning to Copperweld Aristoloy Leaded Steel, "the steel with built-in productivity," to produce quality in quantity.

Ledloy* gives freer machining, faster feeds and speeds and longer tool life.

Ledloy cuts clean for finer finish—often eliminates final machining operation.

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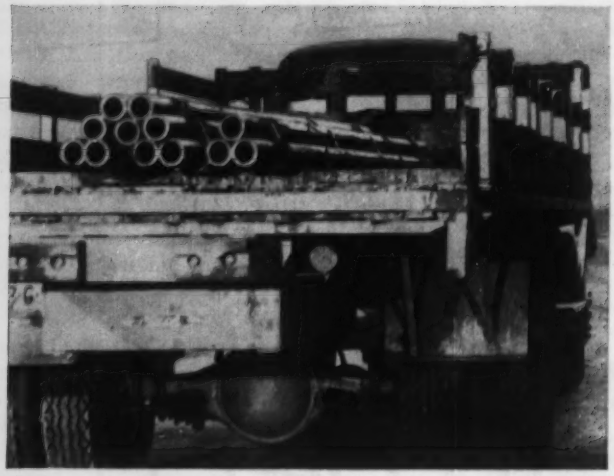
TIMKEN® 52100 steel tubing goes from here



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GOT a rush hollow parts job? Phone, wire or write the Timken Company. We'll ship you less-than-mill quantities of 52100 steel tubing from mill stock within 24 hours after receiving your order. It's the ideal steel for many of your hollow parts jobs.

Besides saving you time, Timken® 52100 steel tubing can save you money. It can be substituted for more expensive steels. It's through-hardened in moderate sections and can be heat treated to file hardness and tempered back to any desired point.

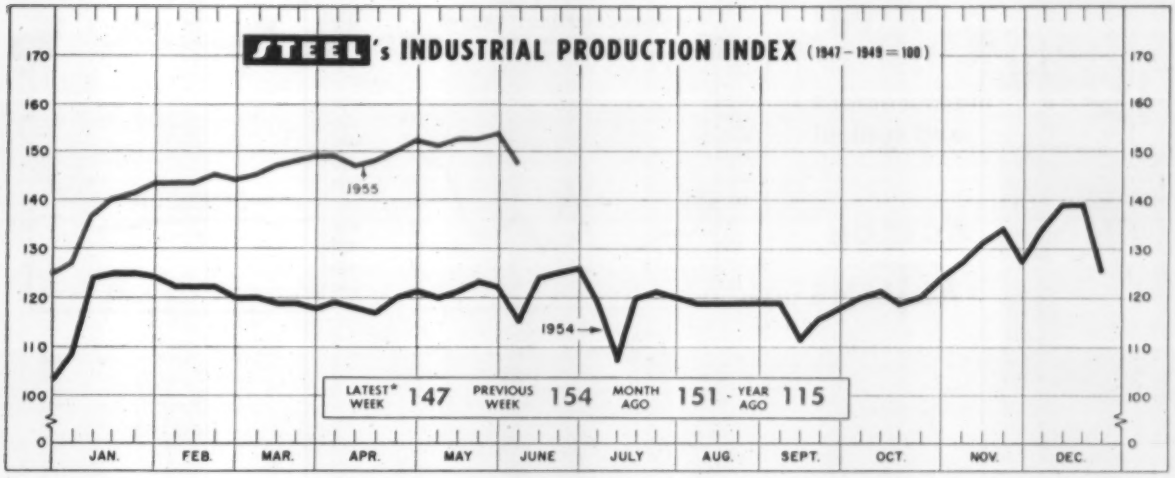
Available in sizes from 1″ to 10½″, Timken 52100 steel is especially suited for hollow parts jobs like aircraft parts, ball bearing races, pump parts and plungers, collets, bushings, spindles, grinding machine parts, and precision instruments.

As America's pioneer producer of 52100 steel, the Timken Company has unequalled experience, assuring you of uniform quality from tube to tube and heat to heat. And we're the only company that makes 52100 steel in tubes, bars and wire.

For fast delivery of your less-than-mill quantity orders, pick up your phone right now. Call The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended June 4. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Auto Peace Means Good Business Will Continue

IF YOU can visualize being patted on the back and kicked in the seat of the pants at the same time, you have a good idea of business' reaction to the auto contract settlement.

No major auto strike means the U.S. probably will have its most productive year. That's good. Not so good is the labor picture over the next few years for smaller firms (page 65) and in industries other than auto.

Me, Too—You can bet the steelworkers, electrical workers, the railroad unions and others will press for their "supplemental unemployment compensation" at the first opportunity.

Also to be considered are possible cutbacks in auto industry employment to hold down GAW liability and postponement of plant and equipment outlays, now running over $1 billion a year. Too, auto industry suppliers may find business booming in years of good auto sales, virtually nonexistent in poor ones as the auto companies pull in work to keep their own men busy.

Clear Road—But till then it looks like good business ahead. June auto production is scheduled to be even higher than May's all-time record of nearly 725,000 cars, says *Ward's Automotive Reports*. That means by July 1, the industry will have produced more than 4.3 million cars, nearly as many as in all of 1952.

In spite of continuing high production, the way is being paved for a repeat of last year's superorderly model cleanup. Dealers' inventories are at a good 27-day supply level, compared with a 31.5-day supply at this time last year.

Changeover — Inventories may climb a little in June, but not so much as to be troublesome. In July, production schedules will fall off rapidly so dealers can finish up the model year in good shape.

Some makes will shut down for model changeover as early as July, *Ward's* says. And changeover is likely to take longer this year than

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,334[1]	2,312	1,746
Electric Power Distributed (million kw-hr)	9,750[1]	9,976	8,246
Bitum. Coal Output (1000 tons)	9,325	9,250	7,279
Petroleum Production (daily avg—1000 bbl)	6,643[1]	6,655	6,466
Construction Volume (*ENR*—millions)	$324.1	$402.7	$204.4
Automobile, Truck Output (*Ward's*—units)	166,146[1]	209,939	119,688
TRADE			
Freight Car Loadings (1000 cars)	750[1]	790	612
Business Failures (Dun & Bradstreet, no.)	200[1]	204	218
Currency in Circulation (millions)[3]	$29,961	$29,826	$29,934
Dept. Stores Sales (changes from year ago)[3]	+10%	+8%	+8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,741	$19,334	$16,908
Federal Gross Debt (billions)	$277.5	$277.4	$273.5
Bond Volume, NYSE (millions)	$16,549	$18,052	$12,619
Stocks Sales, NYSE (thousands of shares)	9,711	10,140	7,321
Loans and Investments (billions)[4]	$84.3	$84.7	$80.5
U. S. Govt. Obligations Held (billions)[4]	$33.3	$33.7	$33.0
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.75
STEEL's Nonferrous Metal Price Index[6]	237.1	237.2	214.5
All Commodities[7]	110.2	110.2	110.7
Commodities Other than Farm & Foods[7]	115.6	115.6	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278; 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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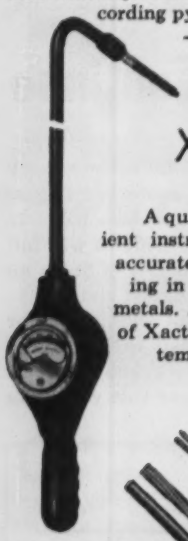
Controls temperature automatically within a fraction of a degree in any heat process. A complete factory-assembled unit ready for installation anywhere. Can be used with any existing indicating or recording pyrometer controller —regardless of age.



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Hand Pyrometer

A quality-built, convenient instrument for quick, accurate temperature reading in molten nonferrous metals. Also, other models of Xactemp for all-around temperature checking.

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Thermocouple Wire
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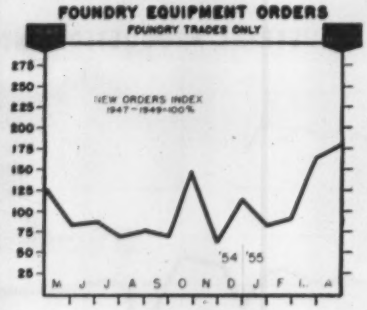
THE BUSINESS TREND



	1955	1954	1953
Jan.	81.0	173.8	99.6
Feb.	90.4	99.9	97.5
Mar.	163.6	82.7	132.2
Apr.	178.6	125.3	111.8
May	....	80.8	182.1
June	....	86.4	156.4
July	....	68.8	158.9
Aug.	....	75.6	235.5
Sept.	....	68.3	127.7
Oct.	....	147.5	87.1
Nov.	....	61.4	149.4
Dec.	....	113.9	160.8

Foundry Equipment Mfrs. Assn.
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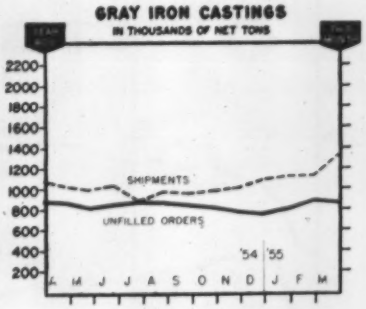


	Shipments		Unfilled Orders*	
	1955	1954	1955	1954
Jan.	1,092	932	783	872
Feb.	1,106	936	852	865
Mar.	1,315	1,047	842	842
Apr.	....	995	...	826
May	....	943	...	775
June	....	987	...	804
July	....	821	...	829
Aug.	....	935	...	830
Sept.	....	921	...	811
Oct.	....	942	...	789
Nov.	....	997	...	760
Dec.	....	1,074	...	745
Total	....	11,530		

*For sale. U. S. Bureau of the Census.

last. The critical factor in determining new model introduction dates probably will be the condition of dealers' stocks.

Steel Stays Hot . . .

Continuing high auto outturn will keep steel production up. Summer vacations may cut into output somewhat, but not much of a dip is expected because of continuing strong demand. Any serious dropoff will be nipped in the bud by automotive orders following mass model changeovers in August and September.

Reflecting the high level of steel operations is employment in the industry, up 13,300 in April. It was the third straight month of increase and pushed employment to 643,200.

Also increasing is the average hourly employment cost, which includes the estimated cost of pensions, social security and insurance. It was $2.586 in April, compared with $2.564 in March.

Total payroll, though, dropped during the month, to $282 million from $288 million. Most of the fall is accounted for by a reduction in overtime pay, as the workweek dipped to 39.9 hours from 41.1 hours. Part of the reduction in the workweek is accounted for by higher employment.

PAs See Good Second Half . . .

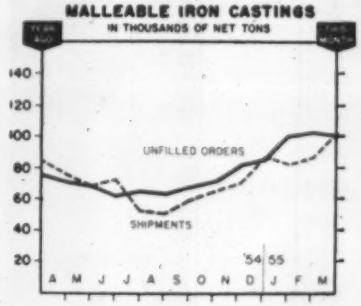
Continuing high and steady employment over a wider range of operations is reported for May by the Purchasing Agents of Chicago. Only 2 per cent of the PAs note smaller employment, against 38 per cent who say employment rose during the month.

Three out of five of the PAs expect the full employment, increased production, heavy order backlog and the strong profit position of the first half to continue into the second. Twenty per cent see better business in the second half, while an equal number predict that business will be slower.

Business Levels Off . . .

Some tapering off of the business upswing was noted during the month. Fewer than 10 per cent note production dips, but it's an increase from April. Also reported was a small slowup in the rate of incoming orders, with 10 per cent of the firms shifting from a position of increasing backlogs to one of steady or decreasing orders on hand.

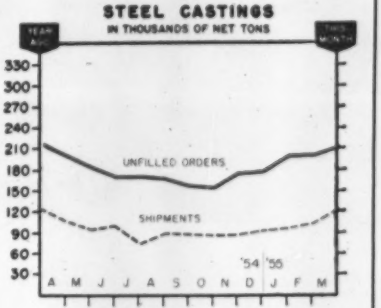
MALLEABLE IRON CASTINGS
IN THOUSANDS OF NET TONS



	Shipments		Unfilled Orders*	
	1955	1954	1955	1954
Jan.	82.0	70.3	99.8	85.6
Feb.	86.0	69.1	101.8	81.6
Mar.	102.4	84.3	99.7	74.2
Apr.	....	....	74.5	.... 69.1
May	....	....	67.9	.... 67.0
June	....	....	72.8	.... 60.2
July	....	....	50.9	.... 63.7
Aug.	....	....	59.3	.... 62.5
Sept.	....	....	58.0	.... 66.7
Oct.	....	....	64.3	.... 71.1
Nov.	....	....	70.0	.... 80.7
Dec.	....	....	87.9	.... 86.1
Total	....	....	829.3	

*For sale. U. S. Bureau of the Census.

STEEL CASTINGS
IN THOUSANDS OF NET TONS



	Shipments		Unfilled Orders*	
	1955	1954	1955	1954
Jan.	98.2	122.8	201.8	251.8
Feb.	106.4	116.5	202.3	234.6
Mar.	127.5	122.3	215.1	214.3
Apr.	....	105.8	....	197.9
May	....	94.6	....	182.5
June	....	100.0	....	169.6
July	....	75.8	....	170.6
Aug.	....	89.6	....	168.3
Sept.	....	88.4	....	158.8
Oct.	....	87.1	....	154.1
Nov.	....	87.7	....	175.7
Dec.	....	93.5	....	179.1
Total	....	1,184.1		

*For sale. U. S. Bureau of the Census.

Deliveries by suppliers continue slow, say the PAs. Prices still are going up but show signs of leveling off. Buying policy is lengthening with over 75 per cent now in the 30 to 90-day bracket.

Building: Bigger Boom Ahead . . .

Construction continues to make news with its sustained drive to new records. Contract awards in the first 22 weeks of this year are almost half again as much as they were a year ago and almost a fifth higher than the old 1953 dollar volume record.

Awards so far are $7.9 billion, reports *Engineering News-Record*. Mass housing continues to spark the boom. These development-type projects have climbed to a new peak of $3 billion, 66 per cent above the old record set last year. Highway contracts also are at an all-time high.

Numerous forecasts for the construction industry see the boom continuing, even growing. Some tapering off in housing starts is looked for next year, down from this year's estimated 1.3 million to perhaps 1.1 million. But that's about the lower limit predicted.

Other construction is expected to take up any slack. Roadbuilding is on the increase. Industrial building will add strength, as will high state and local spending for civic improvements.

Trends Fore and Aft . . .

Ford claims first quarter auto sales lead . . . Billings of commercial heat treaters in April were 10 per cent above the year-ago figure, reports Metal Treating Institute . . . Radio and TV set production dipped seasonally in April but remained above last year's pace, says the Radio-Electronics-Television Manufacturers Association. April output: 1,099,775 radios, 583,174 TV sets . . . Factory employment in the Los Angeles metropolitan area set a new record for the third consecutive month, according to the Security-First National Bank. Aircraft employment is highest since World War II. The number of motor vehicle and scientific instrument workers hit all-time peaks . . . New orders received during 1955 will exceed those of 1954 perhaps by more than 10 per cent, Gwilym A. Price, president, told stockholders of Westinghouse Electric Corp. . . . Consumer buying is holding up. Department store sales to date are 7 per cent above last year's.

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±.0004" is run-of-the-mill

Typical of the care that assures absolute uniformity in all Somers THIN STRIP is this 4-high mill equipped with the latest electronic gages and controls. Here thickness is constantly checked throughout the run, and maintained within ±.0004" or less on gages from .010" down. The slightest variation may be instantly corrected.

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Somers Brass Company specializes in rolling nickel and its alloys from .020", and copper and its alloys from .012" both down to .00075".

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Thumb Replaces Spot Welder with Tinnerman SPEED NUTS!

Here is a typical assembly-line scene . . . a Tinnerman "J" type SPEED NUT being applied to a panel where a weld-type fastener was formerly used. That's the way to cut assembly costs—by saving precious man-hours and eliminating the need for special skills, tooling and equipment!

This one-piece, self-locking, spring steel SPEED NUT brand fastener not only makes welding unnecessary, but it also eliminates clinching, staking, tapping, and costly threaded inserts. It snaps in place by hand quickly, easily, and provides a heavy-duty vibration-proof attachment. Self-retained in screw-receiving position, it is ideal for blind-location assembly.

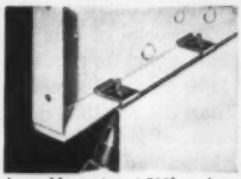
"J" type SPEED NUTS are available for a full range of screw sizes and panel thicknesses. In all, there are more than 8000 variations of SPEED NUT brand fasteners to help you reduce assembly costs. See your Tinnerman representative soon . . . and write for your copy of SPEED NUT "Savings Stories."

TINNERMAN PRODUCTS, INC. • BOX 6688, DEPT. 12, CLEVELAND 1, OHIO

Canada: Dominion Fasteners, Limited, Hamilton, Ontario. *Great Britain:* Simmonds Aerocessories, Limited, Treforest, Wales. *France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine). *Germany:* Hans Sickinger GmbH "MECANO", Lemgo-i-Lippe.

TINNERMAN Speed Nuts®
FASTEST THING IN FASTENINGS®

"J" type SPEED NUTS eliminate problems of hole misalignment and paint clogging on heating unit.



Assembly costs cut 50% on farm equipment with "J" type SPEED NUTS.

"J" type SPEED NUTS help plastic sign maker save 48% in assembly costs.

CLAUDE B. KERSHNER
. . . Birdsboro Steel purchasing dir.

DONALD D. CLEGHORN
. . . Chicago Steel Tank gen. mgr.

ERIC A. KERBEY
. . . president of Midwest Piping

Claude B. Kershner was made director of purchases, **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa. He was purchasing agent.

Fremont Fisher joined **Howard Industries Inc.**, Racine, Wis., as general sales manager. He was with Howe Scale Co., serving for the last two years as Chicago branch manager.

Lukens Steel Co. appointed **Thomas T. Watson** manager of metallurgical development; **Joseph G. Althouse**, chief metallurgical engineer; **Samuel D. Lemmon**, metallurgical service engineer; **H. A. Grubb**, metallurgical plant engineer; and **P. R. Chandler**, metallurgical engineer-processing.

Norman K. Pettigrew joined **Sargeant & Wilbur Inc.**, Pawtucket, R. I., as general manager. He was with C. I. Hayes Inc. **Marshall C. Battey** was made New England sales representative.

Robert G. Kenly was elected a vice president, **New Jersey Zinc Co.**, New York. He was vice president of New Jersey Zinc Sales Co. and continues supervision of that unit.

O. A. Olson was made assistant director of research at **Laclede-Christy Division**, H. K. Porter Company Inc., St. Louis.

Donald D. Cleghorn was named general manager, **Chicago Steel Tank Co.**, Chicago, division of U. S. Industries Inc. He was assistant general manager-operations of Graver Tank & Mfg. Co.

Sun Steel Co., Chicago, elected **James K. Sutherland** executive vice president. He has offices in the Buhl building, Detroit. For the last ten years, he was general manager of steel operations for Ford Motor Co.

Alexander L. Naylor was elected president of **Fairbanks Co.**, New York. Formerly executive vice president, he succeeds his father, the late **George M. Naylor.**

Fischer & Porter Co., Hatboro, Pa., promoted four managers to vice presidents of their divisions. They are: **Robert A. Stern**, data reduction and automation division; **Louis H. Aricson**, international division; **Nathaniel Brewer**, research; and **Edward J. Querner**, manufacturing.

Earl Swanson, former engineer for Hardinge Bros. Inc., joined **Diamond Machine Tool Co.**, Pico, Calif., in charge of its cutting division.

Daniel R. Fulton heads the new Detroit sales office of **Roots-Connersville Blower Division**, Dresser Industries Inc.

Eric A. Kerbey was elected president, **Midwest Piping Co. Inc.**, St. Louis. He was executive vice president. **A. G. Stoughton**, president of Midwest since its formation, continues as chairman of the board and chairman of the executive committee.

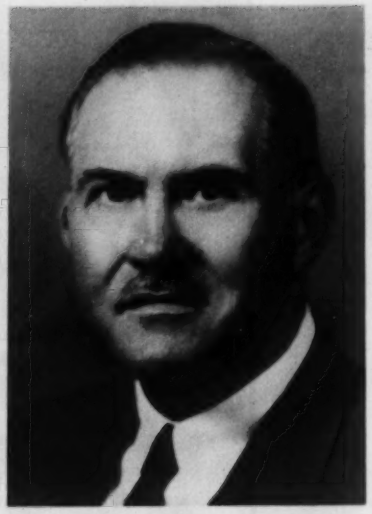
Horace T. Potts Co., Philadelphia, named **Donald C. Taylor** manager, Baltimore warehouse; and **Howard O. Whitaker**, manager of tool steel sales.

Adrien L. Richards was made general superintendent, sheet metal division, **Chrysler Division**, Chrysler Corp., Detroit. He replaces **Stanley Kinney**, now works manager of the body and car division. **Louis J. Lamit** was made supervisor of cost estimating.

George E. O'Brien was made foundry manager at the Brooklyn, N. Y., water meter plant of **Rockwell Mfg. Co.** He was factory manager at the company's new water meter plant at Uniontown, Pa.

Clyde B. Faverty was made director of manufacturing, **Pullman-Standard Car Mfg. Co.**, Chicago. He has been acting director of manufacturing since last September when he succeeded **Norman B. Johnson.** Mr. Johnson, who has acted as a special consultant and vice president since that time, re-

R. P. KELLEY
. . . U. S. Air Conditioning sales post



WILLIAM E. CLARK
. . . Dravo Corp. exec. v. p.

H. E. ALLEN
. . . president, Allen-Sherman-Hoff Co.

tired June 1. **D. R. Carse** was elected vice president, sales department. He continues in charge of the New York office.

R. P. Kelley joined **United States Air Conditioning Corp.**, Minneapolis, as general sales manager. He was vice president and manager of the appliance division of Motor Power Equipment Co. **L. P. Hanson** fills a new post of administrative vice president. He has been vice president-sales since 1947, and now functions as assistant to the president and vice president of engineering.

Lewis S. Hilton was elected president and a director of **Blodgett & Clapp Co.**, Hartford, Conn. He succeeds **J. O. Phelps IV**, resigned, who became chairman of the board. For the last ten years, Mr. Hilton was vice president and general manager of American Steel & Alloys Corp.

A. J. Novak was elected vice president, **Technical Instrument Co.**, Houston, a division of Clevite Corp.'s Brush Electronics unit.

Jack Conrad and **Arthur Sheridan** were named regional sales managers for **Heller Bros. Co.** Mr. Conrad is in Chicago, Mr. Sheridan in New York.

George F. Groff was made vice president-finance, **Crucible Steel Co. of America**, Pittsburgh. Formerly controller, he is succeeded by **Daniel A. Porco.**

William E. Clark was elected executive vice president, **Dravo Corp.**, Pittsburgh. He was vice president and general manager of the engineering works division. Mr. Clark replaces **A. W. Dann**, retired.

International Selling Corp., New York, elected **Y. H. Robert** president; **S. B. Roberts**, executive vice president; **J. T. Dickinson**, vice president; and **G. E. Halpin**, treasurer. **W. P. Bittenbender**, former president and director, resigned to accept an executive position with Chrysler Corp.

W. H. Woods was made general sales manager of National Lead Co.'s **Titanium Pigment Corp.**, New York. He succeeds **K. W. Ericson**, retired. **Earl W. Diener** was made assistant general sales manager.

Divisional sales managers at **Hartford Special Machinery Co.**, Hartford, Conn., are: **L. K. Shepard**, machine tool division; **Harvey L. Spaunburg Jr.**, general contract division; and **Arnold T. Suhart**, machine tool accessory division.

Richard Wagner was made district sales manager for the Lancaster, Pa., territory of **DeWalt Inc.**, subsidiary, American Machine & Foundry Co.

Elmer Syrene was made special projects engineer for Westberg collet mandrels now manufactured by **Erickson Tool Co.**, Cleveland.

H. E. Allen was elected president, **Allen-Sherman-Hoff Co.**, Wynnewood, Pa. He succeeds **B. C. Berry**, now chairman of the board.

Anaconda Copper Mining Co., New York, elected **Roy H. Glover** chairman of the board to succeed **Cornelius F. Kelley**, retired. Mr. Glover was vice president, general counsel and a director.

Industrial Heating Equipment Co., Detroit, appointed **Claude H. Leland** assistant chief engineer.

L. J. Barker was made chief specification engineer of **Kaiser Aluminum & Chemical Corp.**, Oakland, Calif.

Milton G. Peck was made vice president and director of sales and advertising for **Gar Wood Industries Inc.**, Wayne, Mich. He was sales manager, electric industrial truck division, Clark Equipment Co.

W. N. Dambach Inc., Pittsburgh, elected **Lawrence O. Flach** president; **Mildred P. Dambach**, vice president and treasurer; and **Charles E. Lutz**, secretary-assistant treasurer.

L. J. Frey was made assistant sales manager, **Allegheny Steel Band Co.**, Pittsburgh. He was New York district manager.

John H. Van Horne was made manager of the reinforcing products department at the Pittsburgh

ANOTHER EXAMPLE of
REDUCING COSTS WITH—

Buhr

ECONOMATION

Drills, chamfers, spot-faces and individual-lead-screw taps 377 master-brake cylinders an hour gross....

and features electronic mechanism for checking broken drills!

This 7-way dial-type hydraulic-feed Buhr Special has a 48″-diameter 7-position power-operated index table, complete with shot bolt. Two parts are loaded per station in each of its seven fixtures. Automatic clamping of fixtures is performed by a power-wrench with torque control.

Electronic mechanism automatically checks two .028 drills. Following each cycle, drill-checking arms swing sensing probes to and from drills. If either drill is broken, special electronic sensing-circuit stops machine and flashes failure-light.

Buhr

MULTIPLE-SPINDLE
HIGH PRODUCTION MACHINERY

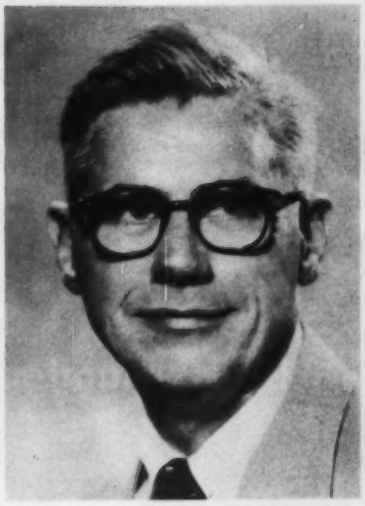
Find out how Buhr Economation can reduce your production costs. Phone, wire or write us. A consultation with one of our top sales executives will be arranged promptly!

BUHR MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

Solidly Engineered • Precision Built • for World's Leading Manufacturers

WALTER H. CREBER JR.
. . . Chicago Steel Service v. p.-sales

CARL D. ROGERS
. . . GMC Truck & Coach position



FRED J. KIRKMAN
. . . Burgess Battery exec. v. p.

steel service plant of **Joseph T. Ryerson & Son Inc.**

Walter H. Creber Jr. was elected vice president-sales, **Chicago Steel Service Co.**, Chicago. **J. Hampton Monroe** was made vice president-treasurer; **O. Joseph Viall**, vice president, with headquarters in Milwaukee; **Fred E. Jorden**, manager of sales; and **F. C. Kemmerling**, assistant manager of sales.

Reynolds Metals Co. appointed **R. M. Chamberlin** manager of Plant 10 and **Frank Ballard** manager of Plant 9 in Louisville. **Alan Sparks**, former manager of both operations, was made manager of all foil and printing operations in the Louisville area.

Gray Co. Inc. appointed **J. J. Michaels** as its New York industrial representative. He was with Minnesota Mining & Mfg. Co.

Carl D. Rogers was made general superintendent, assembly plants, for **GMC Truck & Coach Division**, General Motors Corp., Pontiac, Mich.

Jack L. Berkebile was made district sales manager for **Penn Machine Co.**, with headquarters in Johnstown, Pa.

R. B. Fulton was made Cincinnati district manager, general machinery division, **Allis-Chalmers Mfg. Co.** He succeeds **W. F. Daly**, retired.

DeWitt T. Bronson was elected president of **Tool Fabricators Inc.**, North Hollywood, Calif.

Philip M. Dinkins was elected vice president-operations, dyestuff and chemical division, **General Aniline & Film Corp.**, New York. He was president and director of Jefferson Chemical Co. Inc.

Fred J. Kirkman was elected executive vice president of **Burgess Battery Co.**, Freeport, Ill. He was general manager of the Canadian division at Niagara Falls. **Dr. Joseph J. Coleman**, chief engineer, was made vice president-engineering. **Hiram S. Cramer**, general superintendent, was named vice president-production. **Alex Yule**, previously purchasing agent, was appointed general manager, Canadian division.

Edward C. Wahl was named sales manager, seal division, **Gits Bros. Mfg. Co.**, Chicago.

Earl C. Petrie was appointed director of research of **North American Refractories Co.**, Cleveland.

L. H. Christensen resigned as executive vice president and secretary of **Reid Avery Co. Inc.**, Baltimore. He will be a consultant.

OBITUARIES . . .

Donald I. Hathaway, 41, chief production engineer, **Barden Corp.**, Danbury, Conn., died May 21.

Franz G. Schwalbe, 57, president, **Toledo Engineering Co.**, Toledo, O., died May 21.

Roger D. McKinnon Jr., production manager, **Thies Mfg. Co.**, Alhambra, Calif., died May 25.

Ernest H. Katz, 62, president, **Bayonne Steel Co.**, Long Island City, N. Y., died May 29.

James A. Slater, 80, assistant to the president, **National Malleable & Steel Castings Co.**, Cleveland, until retirement two months ago, died May 28.

Hall Whitelock, 60, president, **E. H. Whitelock Co. Inc.**, Cleveland, died recently.

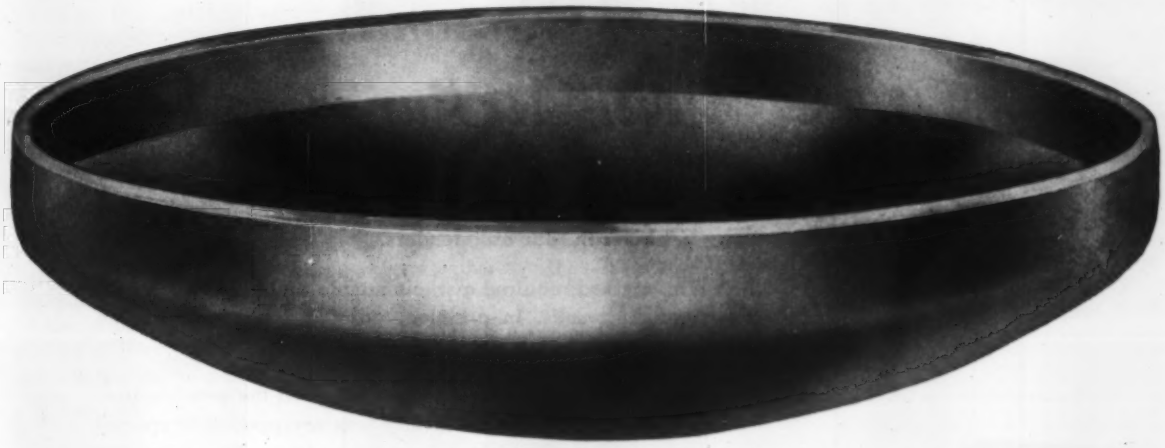
Donald H. Merry, 35, manufacturing manager, **Lycoming Division**, Avco Mfg. Corp., Stratford, Conn., died May 27.

G. A. Lillieqvist, 61, research director, **American Steel Foundries**, Chicago, died May 31.

Sturtevant Erdmann, 55, purchasing agent, **Union Carbide & Carbon Corp.**, New York, died May 27.

William J. Kelly, 56, president, **Machinery & Allied Products Institute**, and senior partner of **William Kelly & Co.**, Chicago, died May 29.

CARBON, ALLOY, STAINLESS-CLAD AND OTHER FERROUS AND NON-FERROUS METALS



name your dish

You name it and we'll supply it. Claymont Flanged and Dished Heads are available in carbon, alloy and stainless-clad steel in diameter sizes from 9 inches to 19 feet—in thickness from 3/16 inch to 6 inches. Our flanging department can also handle forming operations on both ferrous and non-ferrous metal supplied by you.

To order, contact our nearest sales office or write direct to Claymont Steel Products Department, Wickwire Spencer Steel Division, 813 West Street, Wilmington 99, Delaware.

For your convenience, Claymont Flanged and Dished Heads are strategically stocked at CF&I warehouses throughout the country.

CF&I

Claymont Steel Products

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

ABILENE • ALBUQUERQUE • AMARILLO • ATLANTA • BOISE • BOSTON • BUFFALO • BUTTE • CASPER • CHICAGO • DENVER • DETROIT • EL PASO • FT. WORTH • HOUSTON
LINCOLN (NEB.) • LOS ANGELES • NEW ORLEANS • NEW YORK • OAKLAND • ODESSA • OKLAHOMA CITY • PHILADELPHIA • PHOENIX • PORTLAND • PUEBLO
SALT LAKE CITY • SAN FRANCISCO • SEATTLE • SPOKANE • TULSA • WICHITA • *Canadian Representatives At* • EDMONTON • TORONTO • VANCOUVER • WINNIPEG

OTHER CLAYMONT PRODUCTS

Carbon and Alloy Steel Plates • Stainless-Clad Plates • Manhole Fittings and Covers
Large Diameter Welded Steel Pipe • Flame Cut Steel Plate Shapes

2680

AIRengineering at work

REPORT No. 4150.25

Cuts 60 Second Metal Drilling Job to 15 Seconds . . . with Air Punching Tool

A sub-contractor for a large auto manufacturer formerly used two men, an electric drill and a drilling jig to drill two ¼" holes in rear auto fenders.

This method required a whole minute and failed to provide uniform results. In addition, paint damage and broken drills caused excess time loss.

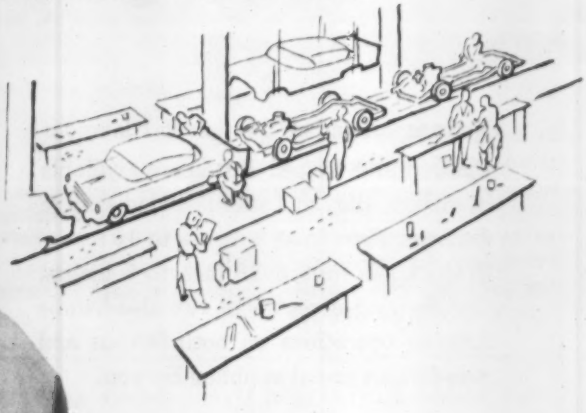
AIRengineering by Ingersoll-Rand solved the problem fast. A size AR130 Air Buck Riveter was equipped with special yoke, punches and stripping mechanisms. The holes are now punched four times faster, with closer tolerances and only *one* man is required instead of two.

If you are in a position to encourage cost-savings in your plant, you should see I-R's confidential manual reports on "AIRengineering at Work". Write on your company letterhead and we'll arrange for you to see it soon.

AIRengineering Manual
Over 100 interesting and helpful case history applications of AIRengineering at work.

Ingersoll-Rand

11 Broadway, New York 4, N.Y.



Air Buck Riveter
Punching two ¼" holes in rear auto fender.

8-257

More Aluminum on Way

Alcoa's expanding Davenport mill to roll wider sheet and plate; adds equipment at Vancouver

ALUMINUM producers are making heavy contributions to national defense and the economy by expanding production facilities and improving fabricating techniques and equipment. Aluminum Co. of America, Pittsburgh, announces important additions to its facilities in Washington and Iowa.

Wider Sheets—A further phase in its three-year-old expansion of aluminum sheet rolling facilities at its Davenport (Iowa) Works has been started. The project calls for installation of what the firm says is the widest (160 in.) hot sheet rolling mill ever built for the aluminum industry, plus other supporting facilities.

The wide mill will supplement an existing "hot line" which rolls cast ingots into plate and semifinished coiled sheet. Other equipment on the line includes a 144-in. reversing mill and a 5-stand, tandem, 100-in. mill for continuous rolling of hot-coiled sheet.

Part of a continuous expansion program under way since 1952, the $20-million installation marks the fifth major project in the nearly completed undertaking.

$46-Million Project — Over the last three years, the Davenport location has been the scene of a series of integrated expansion projects, calling for expenditures of more than $46 million. Initially, a $7-million Air Force tapered sheet and plate mill project was announced in March, 1952, and completed a year ago.

Since January of this year, Alcoa has announced the start of three additional steps in the long-planned program. They include a 100-in. cold mill for finish rolling coiled aluminum sheet, a series of special furnaces, and an 8000-ton Air Force "stretcher" to flatten heavy aluminum plate, a $10-million installation.

Capable of exerting a two-way pull of 16 million lb, the stretcher will enable Alcoa to produce plate in widths up to 144 in., lengths up to 60 ft and thicknesses up to 6 in. This installation will include a heat-treatment furnace (12 x 60 ft), quenching and handling facilities and a 60-ft aging furnace. All this equipment will be owned by the Air Force and leased to Alcoa. To supplement the $6-million Air Force project, Alcoa, at a cost of more than $4 million, will construct buildings to house the equipment and to provide supporting facilities, such as cranes and power distribution systems.

Vancouver Mill—Alcoa will add $160,000 in auxiliary metal handling equipment at its Vancouver, Wash., mill which started operations late in 1954. It will permit greater utilization of the extrusion facility and increased output. At present, the $3,360,000 installation is operating at its nominal capacity. The new equipment was added to the Vancouver operations as part of a $6.7-million fabricating expansion which includes a new ingot casting unit that produces aluminum alloy ingot for the extrusion mill, and an addition to the original cablemaking installation.

Bliss Forms Die Supply Unit

E. W. Bliss Co., Canton, O., established a Die Supply Division. Formerly known as Die Supply Co. with plant and general offices in Cleveland, it was acquired by Bliss in 1953. It continues to make die sets, die springs and other diemakers' supplies. New manufacturing facilities are in Detroit and San Jose, Calif.; assembly plants and warehouses are in Dayton, O., and Buffalo.

Opens Birmingham Warehouse

Oliver Iron & Steel Co., Pittsburgh, opened a warehouse and sales office for its Pole Line Materials Division in Birmingham. Edward S. Norwood is regional sales manager.

Alpha Corp. Changes Name

Alpha Corp., Stamford, Conn., changed its name to Alpha Molykote Corp. The firm makes industrial lubricants.

Litton Buys Electronics Firm

Litton Industries, Beverly Hills, Calif., electronics firm, purchased controlling interest in Ahrendt Instrument Co., College Park, Md., manufacturer of automatic control equipment.

Anaconda Copper Renamed

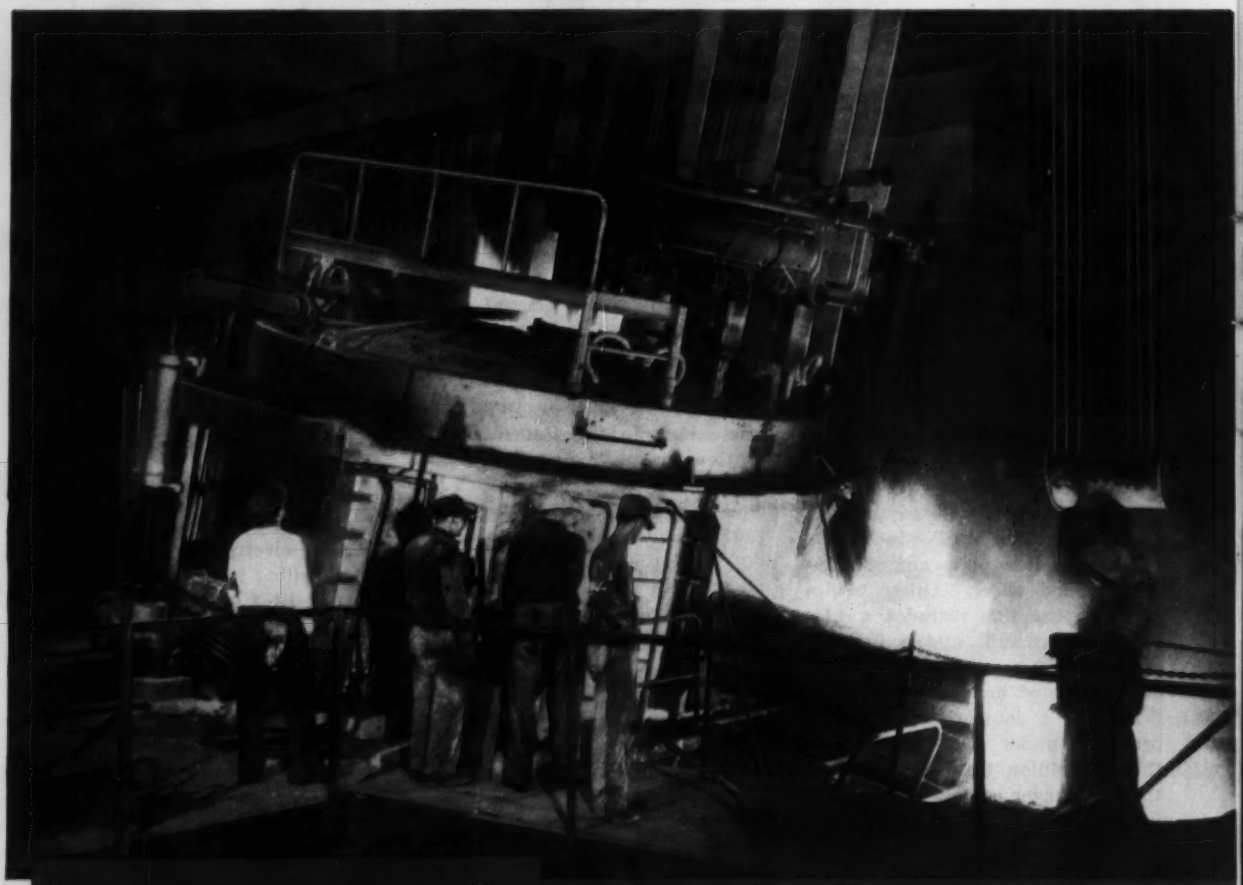
Anaconda Copper Mining Co., New York, changed its corporate

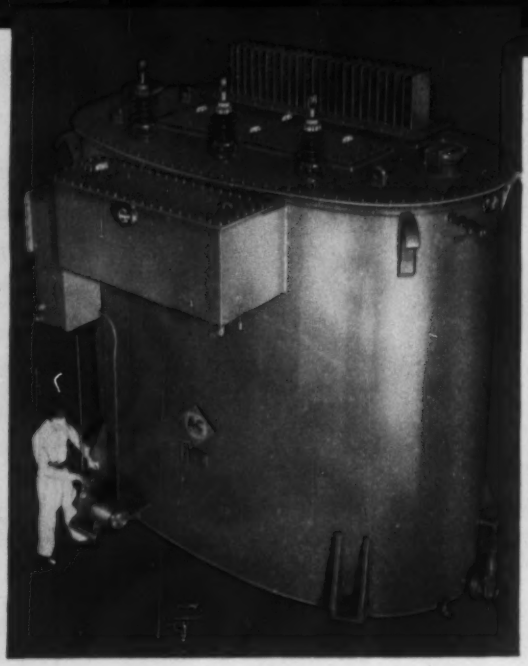
(*Please turn to page* 96)

National Works Lifts Pipe Size to Perfect 36

Diameter range of electrically welded pipe supplied by National Works of U.S. Steel Corp.'s National Tube Division has been extended. First carload of the new product, 36-in. pipe for natural gas lines, leaves McKeesport, Pa., plant

Reduce Cost of





TRANSFORMERS

Well-balanced design and extra-heavy duty construction are used in the Allis-Chalmers arc-furnace transformer. Past records show ability to withstand as much as 25 to 30 years of the repeated daily short circuits encountered in furnace operation. Extremely heavy supports and structure are used to brace coils against the severe short-circuit stresses.

Skillful insulation techniques protect windings from overvoltage due to wide tap range. Some units are designed for as much as 50% range in secondary voltages. Tap-changing mechanism, specially designed for arc-furnace transformers, is in separate compartment to facilitate maintenance. Wide flat contacts provide the long life needed for numerous daily tap-changing operations.

ALLIS-

Arc-Furnace Steel

Use Allis-Chalmers Integrated Electrical Equipment—and you...

SAVE **on Engineering** — Allis-Chalmers steel mill specialists coordinate equipment, submit single complete package proposal.

SAVE **on Purchasing** — One order, one invoice, one follow-up for the complete furnace electrical system.

SAVE **on Installation** — All components are matched for easy installation. Delivery is coordinated to prevent delays.

SAVE **in Operation** — All equipment is designed and built to work together. One reliable supplier guarantees performance of complete electrical system.

TAKE ADVANTAGE of Allis-Chalmers complete line of arc-furnace equipment—transformers, *Regulex* control, switchgear, associated controls—backed by 45 years of experience. Call your nearby Allis-Chalmers District Office for assistance when you are planning new facilities or modernization. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.

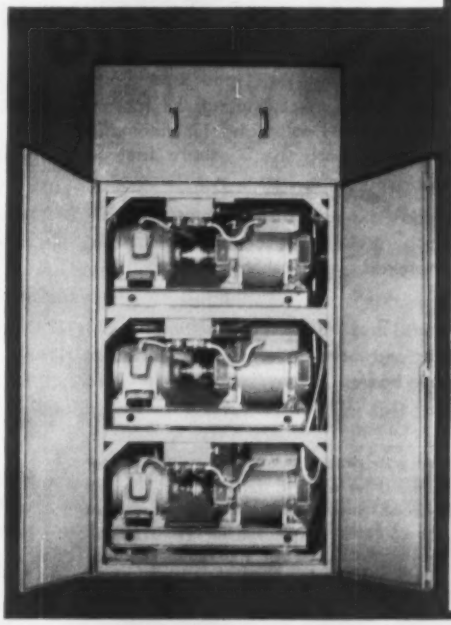
Regulex and *Ruptair* are Allis-Chalmers trademarks. A-4742

REGULEX CONTROL

Balances arc current with arc voltage almost instantly—maintains desired arc conditions by automatically varying distance between electrode and charge.

With *Regulex* rotating amplifier there are no contacts or switching devices between the regulator and electrode motor. Continuously closed circuit provides constant positive control, minimizing current surges, cutting power consumption.

Simple design of *Regulex* results in lower maintenance. Provisions for spare unit mounted on top assure continuous operation under all conditions. Tier construction — open or enclosed —conserves valuable floor space.



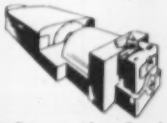
Other Allis-Chalmers Equipment for the Steel Industry

Wide Range of Motors for main mill and auxiliary equipment drives—ac or dc—from 1 hp to 10,000 hp—and supporting m-g sets or rectifiers.

Transformers for mill service include metering transformers, distribution transformers, power transformers, and unit substations.

Switchgear ranges from low voltage metal-enclosed units to large metal-clad types — includes *Ruptair* and oil circuit breakers. Also large power circuit breakers.

Blast Furnace Blowers are a part of the A-C line of single and multi-stage blowers, axial and rotary compressors, and vacuum pumps for the steel industry.



Power Generation Equipment includes steam turbine-generator units 2000 kw and larger for fluctuating steel mill loads. Also condensers, pumps and auxiliary-drive motors.

CHALMERS

A-C ALLIS-CHALMERS

● When Studebaker Division, Studebaker-Packard Corporation switched to Ransburg No. 2 Process of Electrostatic Spray painting on their automobile chassis, paint mileage was increased 9 times.

By simply putting the paint where it's supposed to go, Studebaker cut daily paint consumption on the chassis production line from 14½ drums to 1½ drums. And, still they are painting 6 more chassis per hour with the No. 2 Process.

In addition to getting better, more uniform coverage with the asphalt-type coating, paint and labor costs were cut 70¢ per chassis. In eliminating the former set-up with 2 water wash booths and 12 automatic spray guns, they save nearly 1000 square feet of badly needed floor space.

Another on-the-job-example of the unmatched efficiency of the Ransburg No. 2 Process in which quality of the work is improved . . . AT LESS COST!

* *Studebaker also uses the Ransburg method to apply a heavier and more uniform primer surfacer on automobile bodies.*

Whatever your product—large or small—if your production justifies conveyorized painting, it's possible that one of the Ransburg electrostatic processes can do the job better, with substantial savings to you. We'll be glad to tell you about complete Ransburg services.

Write to Dept. S.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

(*Concluded from page* 93)

name to Anaconda Co. because the firm has extended its operations into many fields other than the mining and processing of copper ore.

Cleveland Firm Opens Plant

Electric Controller & Mfg. Co., Cleveland, completed construction of its ultramodern, $4.5-million plant at 4500 Lee Road, Cleveland. Flexibility was the keyword in planning the layout for the 340,000 sq-ft plant which replaces half a dozen structures. It represents a floor space increase of some 63 per cent. As designs and product demands change, departments can be moved and the production flow completely altered at minimum cost. Overhead space, utilities, hoisting facilities, even compressed air, will be available where required. The plant provides straight-line assembly and considerable automation. The company makes a diversified line of products, ranging from huge lifting magnets to small resistors and switches.

Mid-States Welder Buys Viking

Mid-States Welder Mfg. Co., Chicago, acquired Viking Welding Sales Co. and its line of heavy-duty industrial arc welders.

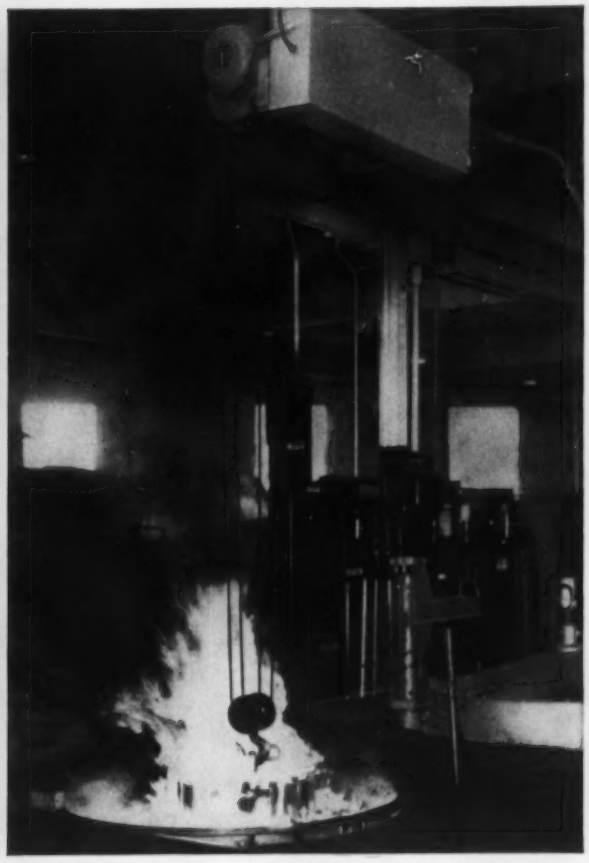
Allis-Chalmers To Expand

Allis-Chalmers Mfg. Co., Milwaukee, will spend about $1 million for expansion at its Gadsden, Ala., plant. An addition of 100,000 sq ft for the manufacture of electrical distribution transformers will be completed by the end of this year. The manufacture of other farm equipment will continue.

J&L Renames Warehouse Unit

The Warehouse Division of Jones & Laughlin Steel Corp., Pittsburgh, has been renamed the Jones & Laughlin Steel Warehouse Division, Jones & Laughlin Steel Corp. This division, with headquarters in Indianapolis, will operate the Hammond, Ind., warehouse of the W. J. Holliday & Co. Division. At present, the Indianapolis warehouse will be operated as the W. J. Holliday &

Yale Cable King lowers load into special heating furnace.



Following heating, aircraft parts are quenched in oil bath.

Yale hoist handles vital aircraft parts in 1,550°F. heat

YALE Electric Cable King—the world's hardest-working hoist—takes on another difficult assignment. This time, it's for Metallurgical, Inc., metal treating specialists of Minneapolis, Minn. Cable King lowers a 2600-lb. load of steel aircraft parts into a radiant tube pit-type furnace, holds it in the intense heat, then quickly lifts it free. Especially important to Metallurgical are Cable King's (1) smooth push-button operation, (2) manual release feature, easily operated by an "O" ring, that prevents air-cooling of vital parts during quench if electric power should fail.

This hoist—the "king" of YALE's complete line of hoists for every lifting job—needs no time out for cooling: exclusive YALE air cooling and load brake lubrication dissipate heat speedily and thoroughly. Cable King is available in capacities of ¼ to 15 tons for mills, foundries, forges, machine shops—wherever *continuous* heavy-duty work cycles are required. Winches to 3 tons are available for wall, ceiling or foot mounting. For full facts, send coupon today.

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*Reg. U. S. Pat. Off.

GAS, ELECTRIC, DIESEL & LP-GAS INDUSTRIAL TRUCKS • WORKSAVERS
WAREHOUSERS • HAND TRUCKS • HAND & ELECTRIC HOISTS

MAIL THIS COUPON TODAY

The YALE & TOWNE Manufacturing Co., Dept. 86
Roosevelt Boulevard, Philadelphia 15, Penna.
Please send detailed information on
☐ YALE Cable King Electric Hoist
☐ Other hoists in the complete YALE line

Company_____

Name_____ Title_____

Street_____ City_____ State_____

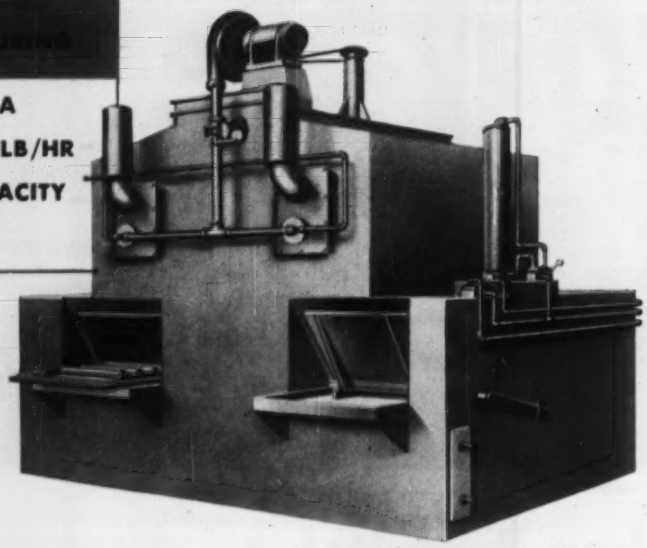
In Canada write: The Yale & Towne Manufacturing Co.
St. Catharines, Ontario, Canada

NEW!

HOLCROFT'S *Bantam-Sized* BATCH FURNACE

FEATURING

A 500 LB/HR CAPACITY



Holcroft's new bantam-sized batch furnace for controlled atmosphere heat treating does a king-sized job at a low, low cost. An entirely new concept of batch operation, the furnace offers new opportunities not only for small plants, but for large ones which have limited or varied production problems. The new batch furnace offers the same engineering know how and quality that has made Holcroft the leader in heat treat development.

It can be adapted to run such typical cycles as: carburizing; carbonitriding; clean, neutral and bright hardening; carbon restoration; normalizing; annealing; tempering and non-ferrous heat treating.

Operation is simple—only two valves are involved. When the stock has completed its time in the furnace chamber it is lowered by an elevator, transferred into position for quenching, and lowered into the quench oil. Simultaneously, a previously-loaded tray of cold work moves onto the charge elevator and then up into the furnace chamber. The operator may remove the quenched stock from the discharge door or load the furnace through the charge door at any time during the heating cycle.

Quenching is fast and there is no loss of heating time loading or unloading. This arrangement reduces atmosphere gas requirements because vestibule flushing takes place while the stock is being heated.

An important feature of the new furnace is its small floor space requirement. No pits are needed; the heat source is above the vestibule —improving working conditions.

HOLCROFT & COMPANY, 6545 Epworth Blvd. Detroit 10, Mich.

VITAL STATISTICS OF HOLCROFT'S FURNACE

1. **Capacity**—can heat 500 lbs. gross per hour to 1500° F. Flexible enough to be operated at temperatures ranging from 400° to 1800° F.
2. **Dimensions**—9' 3" x 6' 9" x 10' 6" high.
3. **Tray size**—two 24" x 18" pinned sections with basket on each section for loading 9" high.
4. **Operation**—three pneumatic cylinders controlled by two hand-operated valves. Can be made completely automatic.
5. **Quench tank**—completely enclosed with built-in cooling. Hot oil optional.
6. **Fan and Pump**—same size as on Holcroft's big batch furnace. Variable controlled oil flow.
7. **Doors**—hinged at the bottom with operating lever at the side of furnace for greater safety.

BUILT BY HOLCROFT & COMPANY DETROIT, MICH.

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • DARIEN, CONN. • HOUSTON, TEXAS
LOS ANGELES, CALIF. • PHILADELPHIA, PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario • EUROPE: S.O.F.I.M., Paris 8, France

Co. Division, under the same management as the J&L Steel Warehouse Division. Changes in executive titles of the Steel Warehouse Division are: G. L. Stewart, president; R. W. Burton, division vice president; H. I. Cawthra, vice president-engineering and operations; J. R. Lambeth, vice president-sales; W. H. Babbitt, division controller; E. J. Keller, assistant treasurer; F. M. Harbison, manager of sales—general products; A. J. Cleveland, manager of sales —special steel products; A. C. Doescher, manager of procurement.

Berns Buys Blower Firm

Electric Blower Co., Boston, has been purchased by Stanley Berns, president of Pullman Vacuum Cleaner Corp., that city. Electric Blower will be operated as a division of Berns Mfg. Corp.

Ferroxcube Deal Canceled

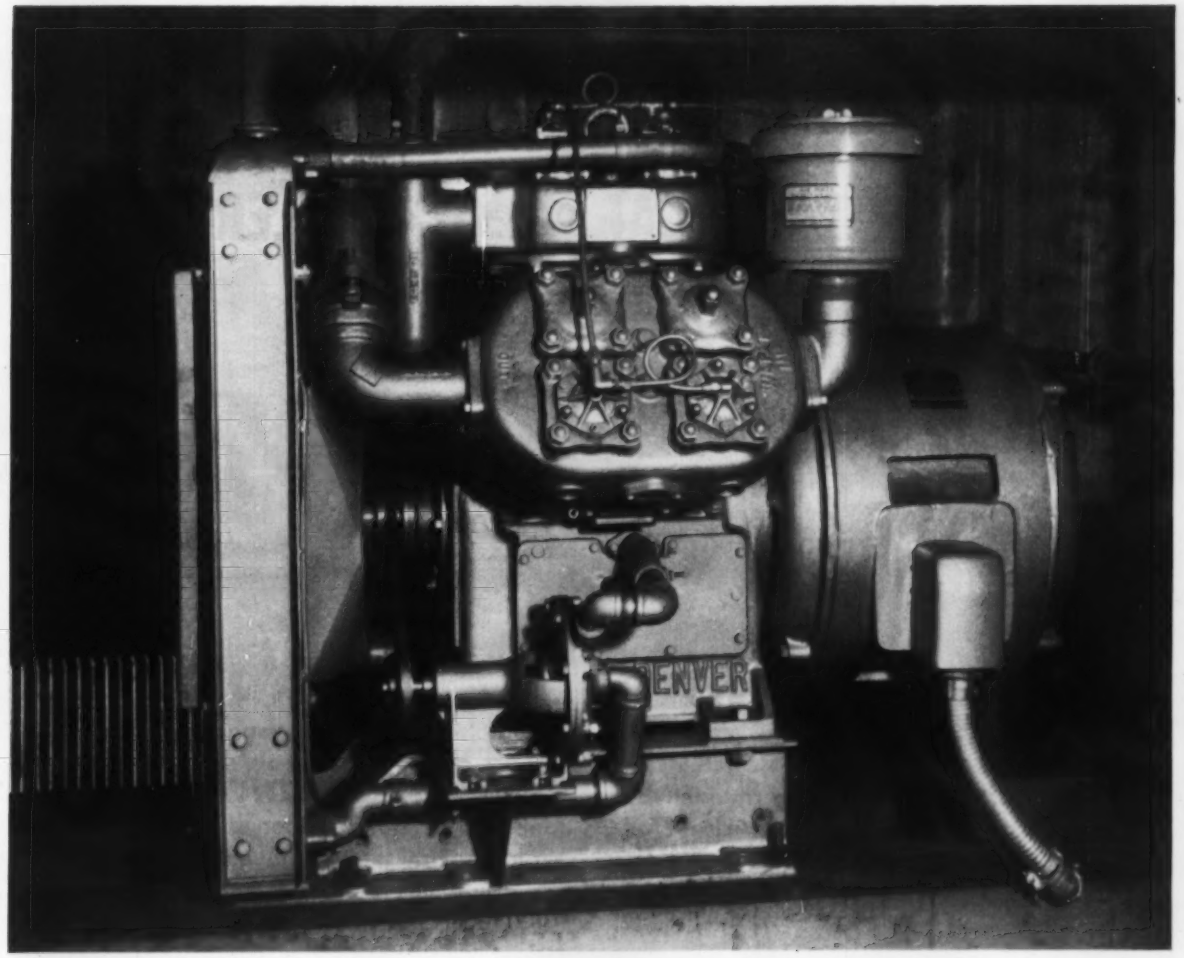
Ferroxcube Corp. of America, North Adams, Mass., announces that the sale of certain of its assets to Indiana Steel Products Co., Valparaiso, Ind., will not be consummated. Ferroxcube's plant at Saugerties, N. Y., will continue to be operated as a joint venture by Sprague Electric Co., North Adams, Mass., and Philips Industries Inc., New York. Ferroxcube Corp. makes ferrite cores and ceramic permanent magnet materials.

Controls Firm Renames Unit

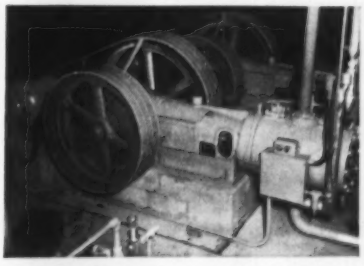
Robertshaw-Fulton Controls Co., Greensburg, Pa., redesignated its American Thermometer Division, St. Louis, as its American Controls Division. The firm's Fulton Sylphon Division opened a warehouse at Lynwood, Calif. It will stock a line of automobile thermostats and temperature controls for industrial applications.

Southeastern Metals Expanding

A $1-million expansion program and establishment of a Cold-Rolled Steel Division at its Birmingham plant is announced by Southeastern Metals Co. The plant will turn out structural steel sections, channels, angles and similar shapes;



You save five important ways with the Gardner-Denver WB Compressor



Put these Gardner-Denver RX Compressors on 24-hour service—and forget about air stoppage. Send for bulletin HAC-40.

1. Seven compact sizes save floor space.
2. Ready to hook up and go—inexpensive foundation requirements.
3. Combination radiator-intercooler saves cooling water where it is hard to come by.
4. High efficiency design saves power costs.
5. And a WB seldom requires more than routine maintenance.

Send for bulletin WB-10

GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

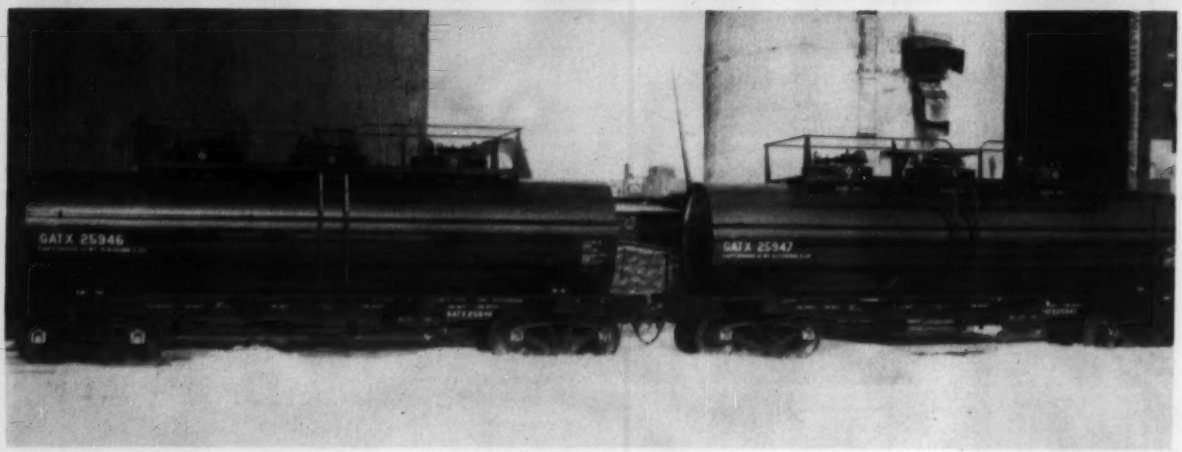
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

GARDNER-DENVER Since 1859 — KELLER TOOLS

HERESITE

REG. U. S. PAT. OFFICE

LININGS FOR TANK CARS AND TRAILER TANKS



Courtesy General American Transportation Co.

RESISTANCE—Heresite linings effectively prevent product contamination of such items as Sulphuric Acid, Rubber Latex, Formaldehyde Battery Acid, Lactic Acid, Acetic Acid, Fruit Juices and Wine. These products can be delivered fresh and full strength, unchanged.

EASE OF CLEANING—Heresite lined tank cars are quickly cleaned by Steaming, Hot Water, or any type of Solvent Wash.

HERECROL

REG. U. S. PAT. OFFICE

SYNTHETIC RUBBER LINING
The strongest caustic hydroxide solutions, as well as the halogen acids and other chemicals, may be transported in a HERECROL lined tank car or trailer tank. Our literature will interest you. Write for it today.

HERESITE & CHEMICAL COMPANY

MANITOWOC, WISCONSIN

Branch Office: 327 South LaSalle Street, Chicago, Illinois

cold-rolled bars, including hexagons, squares and rounds. Equipment is being installed in an adjoining building which was recently acquired.

Opens Hacksaw Plant

American Saw & Mfg. Co. is operating a new hacksaw producing plant at East Longmeadow, Mass. The firm's main plant and headquarters are in Springfield, Mass.

American Pulley Buys Firm

American Pulley Co., Philadelphia, purchased Safeway Industrial Equipment Corp., Chicago, maker of manually and electrically operated hydraulic lift trucks. Manufacturing and engineering will be transferred from Chicago to Philadelphia.

Erects Stamping Plant

A stamping plant has been erected at Eaton Rapids, Mich., for Richard Bros. Division, Allied Products Corp., Detroit. It will be operated in conjunction with the division's die shops in Detroit and Hillsdale, Mich. This facility, equipped with presses capable of handling dies up to 15 ft long and pressure capacities up to 900 tons, will specialize in short-run stampings.

Equipment Firms May Merge

Two Galion, O., firms in the truck equipment field, Hercules Steel Products Corp. and Central Ohio Steel Products Co., will merge, subject to approval of stockholders. Operating divisions of Hercules and their principal products are: Star Mfg. Co., St. Louis, food handling equipment; Galion Metallic Vault Co., Galion, burial vaults; Unisteel Body Co,. Wapakoneta, O., van-type bodies for general hauling and freight handling; and Hercules-Willard Division, truck-mounted concrete mixers. Central Ohio's divisions and their products are: Galion Allsteel Body Co., Galion, dump bodies, hydraulic hoists, refuse collection units and hydraulic loaders; Mansfield Metal Products Co., Mansfield, O., metal fabrications;

(*Please to turn page* 104)

Specify *Michigan* Tubing for economy and versatility

A Quality Product

ROUND

¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
⅜" to ¾"	16 thru 22	⅜" minimum side to 5" maximum side
¾" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

Standard Sizes

Tube Diameter O.D. Size	Maximum Wall Decimal	BWG Gauge	Minimum Wall Decimal	BWG Gauge
¼	.065	16	.022	24
½	.083	14	.022	24
⅝	.095	13	.022	24
¾	.095	13	.022	24
⅞	.095	13	.028	22
1	.095	13	.028	22
1⅛	.095	13	.028	22
1¼	.095	13	.028	22
1⅜	.095	13	.035	20
1½	.120	11	.035	20
1⅝	.120	11	.035	20
1¾	.120	11	.035	20
1⅞	.180	7	.035	20
2	.180	7	.035	20
2⅛	.180	7	.035	20
2¼	.180	7	.035	20
2⅜	.180	7	.035	20
2½	.180	7	.035	20
2⅝	.180	7	.035	20
2¾	.180	7	.035	19
2⅞	.180	7	.042	19
3	.180	7	.042	19
3⅛	.180	7	.042	19
3¼	.180	7	.042	18
3⅜	.180	7	.049	18
3½	.180	7	.049	18
3⅝	.180	7	.049	18
3¾	.180	7	.049	
3⅞	.180			
4				

For almost 40 years

Michigan has been manufacturing tubular parts for leading manufacturers. This acceptance of Michigan tubing has been won by meticulous attention to customer requirements and the supplying of the very best in tubing. The following advantages of low cost manufacture and utmost dependability are yours when you specify Michigan for tubular parts in the fabrication of your products:

1. It is fabricated in round, square and rectangular shapes, in a wide range of sizes;
2. It is always of uniform strength, weight, ductility and weldability;
3. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted and rolled.
4. It can be formed or machined in your plant or prefabricated at Michigan.

Michigan STEEL TUBE PRODUCTS CO.

RESISTANCE WELDED STEEL TUBING

THE OLDEST NAME IN ELECTRIC

Consult Michigan

for engineering and technical help in the selection of tubing best suited to your needs.

Nearly 40 Years in the Business

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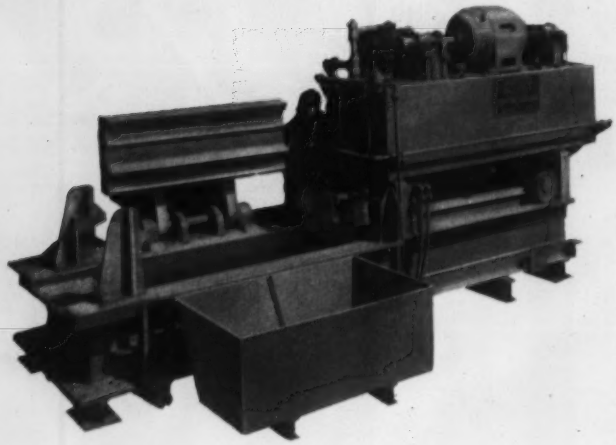
Factories: Detroit, Mich. • Shelby, Ohio

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis —Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—Service Steel Co., Los Angeles, Calif.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—C. I. Crais Co., Birmingham, Ala.

Choose One of the 6 DEMPSTER-BALESTERS... Offering

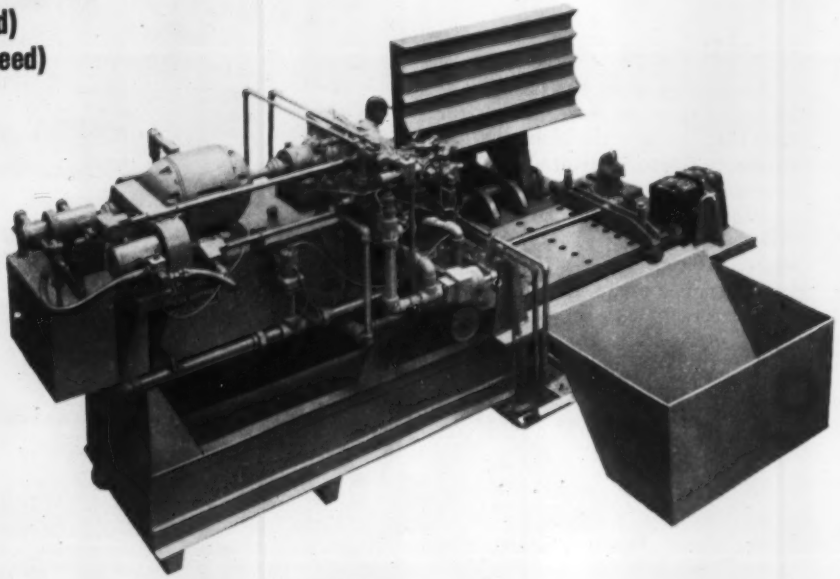


WIDELY RECOGNIZED for top production and low cost operation, Dempster-Balesters are making scrap metal baling highly profitable in over 200 cities and almost every state of the union, as well as 15 foreign countries. The key to the greater profits provided by Dempster-Balesters is due, chiefly, to the 1-2-3-4 hydraulic operation, illustrated in detail in photos below.

Low cost operation is another important factor. This low cost operation is the result of simplified engineering and construction. All hydraulic assemblies are integral to the machine itself. Even the Standard Model 600 and High Speed Model 700 (pictured at right on opposite page) are self-contained requiring no air compressors, springs, counter-weights or supplementary equipment.

Without question, Dempster-Balesters are your best possible buy. And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour. For complete information, write to us today and ask for Catalog No. 530. A product of Dempster Brothers, Inc. *IN CANADA: Manufactured by Hamilton Bridge Co., Ltd. and sold by W. P. Favorite Co., Ltd., 418 Main Street East, Hamilton, Ontario.*

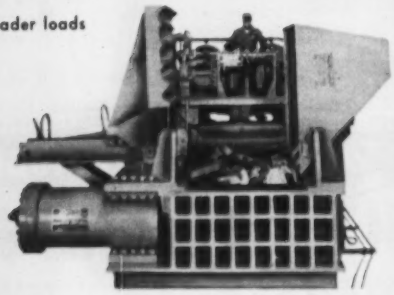
FOR PORTABLE PRODUCTION
Model "125" (Standard)
Model "128" (High Speed)



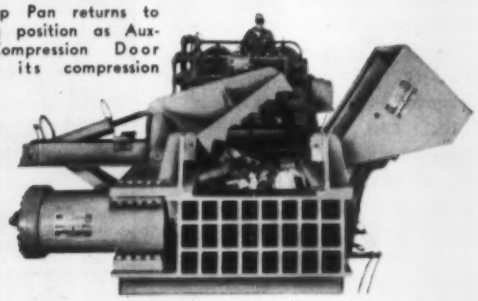
FOR LARGE PRODUCTION
Model "275" (Standard)
Model "350" (High Speed)

Action Photos below illustrate Dempster-Balesters

1 — Skip Pan Loader loads charging box.



2 — Skip Pan returns to loading position as Auxiliary-Compression Door starts its compression stroke.

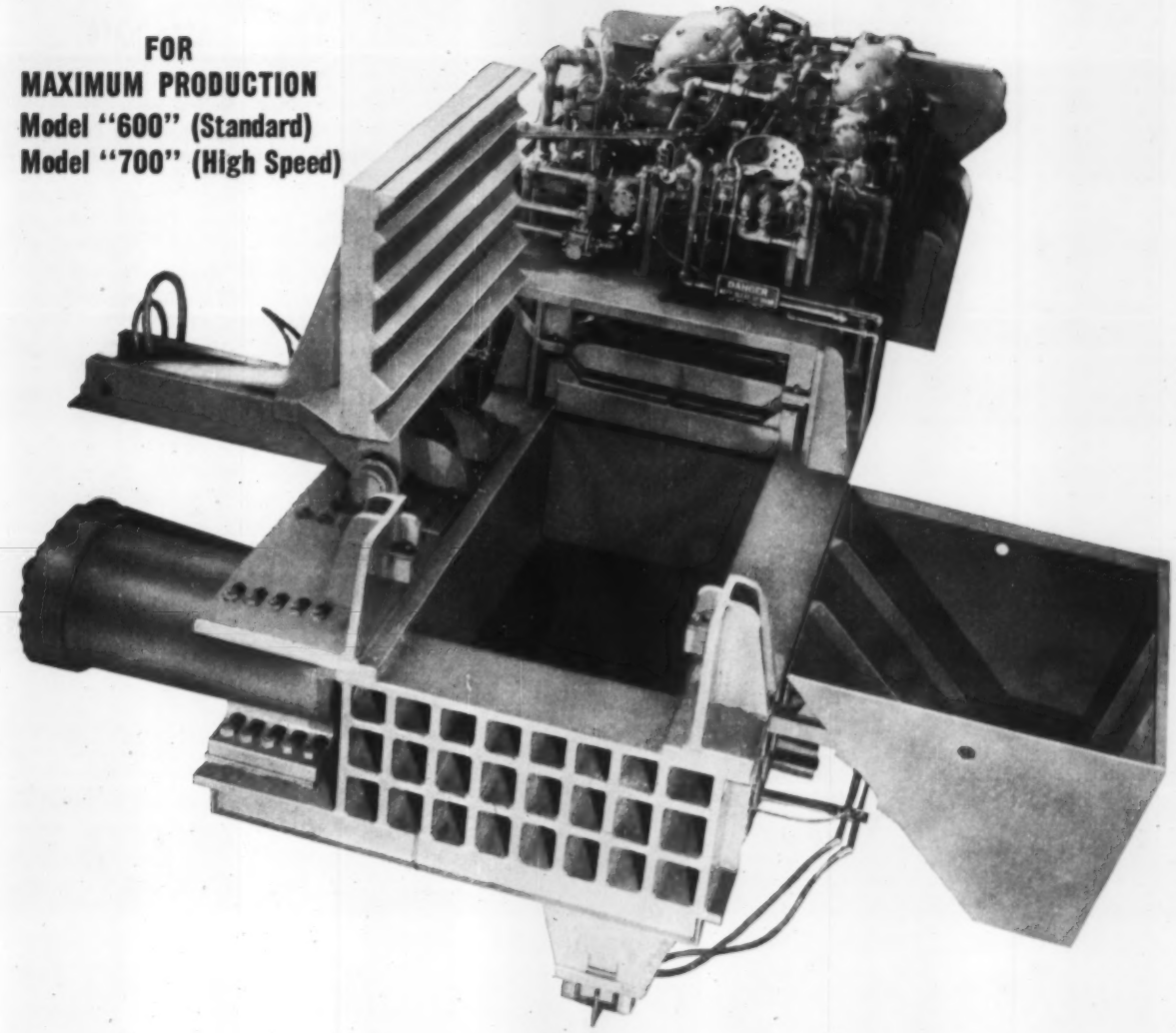


AD 4200

• DEMPSTER STEEL

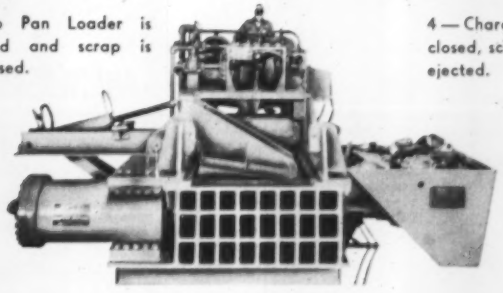
You the Closest Approach Yet to "AUTOMATIC BALING"!

FOR
MAXIMUM PRODUCTION
Model "600" (Standard)
Model "700" (High Speed)

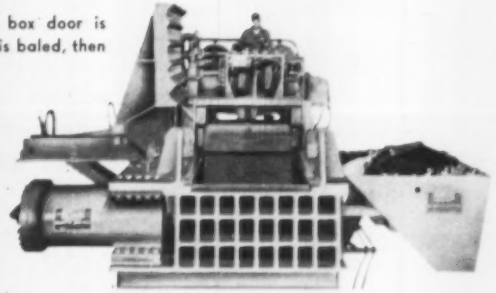


Fast and Power-Packed 1-2-3-4 Hydraulic Operation

3 — Skip Pan Loader is re-loaded and scrap is compressed.



4 — Charging box door is closed, scrap is baled, then ejected.



BROTHERS, 665 DEMPSTER BLDG., KNOXVILLE 17, TENN.

For the
a Aluminum
b Brass
c Copper

NON-FERROUS
WASHERS

Another one-source service of Joliet. Now you can order non-ferrous washers—aluminum, brass and copper from Joliet Wrought Washer Company. Also, of course, a complete line of special, standard, S.A.E., riveting washers, machine screw washers, carborized structural steel washers, malleable and lock washers. Special washers our specialty —Since 1914!

JOLIET
JOLIET WROUGHT WASHER CO. • JOLIET, ILL.

(*Concluded from page* 101)

and Austin Overshot Loader Division, Denver, loading equipment.

ASSOCIATIONS

Joseph F. Miller was appointed managing director of the **National Electrical Manufacturers Association,** New York.

The American Gear Manufacturers Association, Washington, elected M. R. Anderson, executive vice president, Michigan Tool Co., Detroit, president; F. R. Eberhardt, president, Eberhardt-Denver Co., Denver, vice president; and G. E. Gunderson, president, Brad Foote Gear Works Inc., Cicero, Ill., treasurer. Elected to the executive committee are: W. W. Trout, Lufkin Foundry & Machine Co., Lufkin, Tex.; R. W. Johnson, Foote Bros. Gear & Machine Corp., Chicago; J. L. Buehler, Indiana Gear Works Inc., Indianapolis; D. W. Diefendorf, Diefendorf Gear Corp., Syracuse, N. Y.

NEW ADDRESSES

Lehigh Western Steel Products Corp. moved to Industrial road, Addison, Ill.

Harrison Bolt & Nut Co., manufacturer of stainless and alloy bolts and nuts, moved to enlarged quarters at 2781 Wilkens Ave., Baltimore. A. L. Byrd is president.

Taylor Instruments Companies, Rochester, N. Y., moved its San Francisco offices and plant to 1661 Timothy Drive, San Leandro, Calif.

ANNIVERSARIES

Seventy-five years of leadership in the screw machine products and set screw industries are being celebrated this month by George W. Moore Inc., Waltham, Mass. George A. Moore Jr. is president. His son, Richard Moore, represents the fourth generation of the Moore family to be active in the company.

4 HIGH, 5 STAND TANDEM

HOT ALUMINUM MILL

Designed and Built by

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN
CANTON • WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

UNITED *can serve you no matter where in the world you are.*

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

Get the service you need!

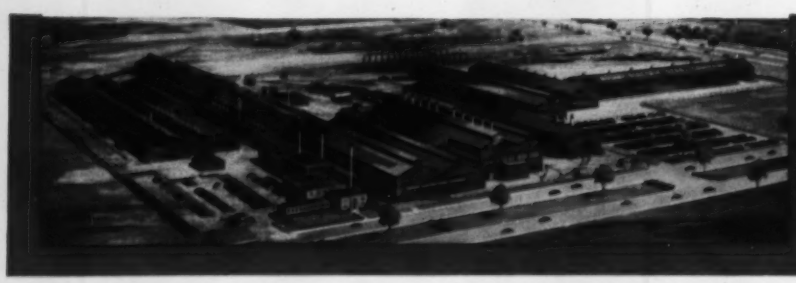
Call **Rotary**

Hot Rolled
Cold Finished
Quality Stainless Steel Bars

STAINLESS BILLETS FOR FORGING IN COMPLETE SIZE RANGES

Rotary Electric Steel Co.

P. O. BOX 4606 • DETROIT 34, MICHIGAN



ALLOY and STAINLESS STEELS
BILLETS • SLABS
HOT ROLLED and COLD FINISHED BARS

SALES OFFICES—Chicago • Cleveland • Newark, N. J. • Hartford, Conn.

SALES AGENTS—Indianapolis • Fayetteville, N. Y. • Houston, Texas

Technical Outlook

TUNGSTEN ELECTRODE SPECS—Now you can select a tungsten electrode from four standard compositions. The American Welding Society and the American Society for Testing Materials have just issued the first specifications for these nonconsumable electrodes. They are used in inert-gas shielded welding and atomic hydrogen welding.

SUPERIOR CONTACTS—Powder metallurgy practice is helping Gibson Electric Co., Pittsburgh, get the best compromise between conductivity and durability in electrical contacts. Some mixtures of silver or copper powder with nickel, tungsten or graphite additions show better than 80 to 90 per cent of the theoretical pure copper conductivity.

STEEL-ALUMINUM BOND—Several years of research has paid off at Hoover Co., Canton, O. Without telling how they do it, the company bonds a 0.012-in. stainless steel sheet to a die-cast aluminum soleplate of an electric iron. They get the light weight of aluminum with the properties of a stainless work surface. Bonding is integrated with the die-casting operation.

SLOW BURN—Particle size makes a lot of difference in graphite's oxidation rate, says the Bureau of Standards. The Bureau has prepared a table which compares graphite flake size with oxidation rate. It should be of value to crucible and mold wash makers.

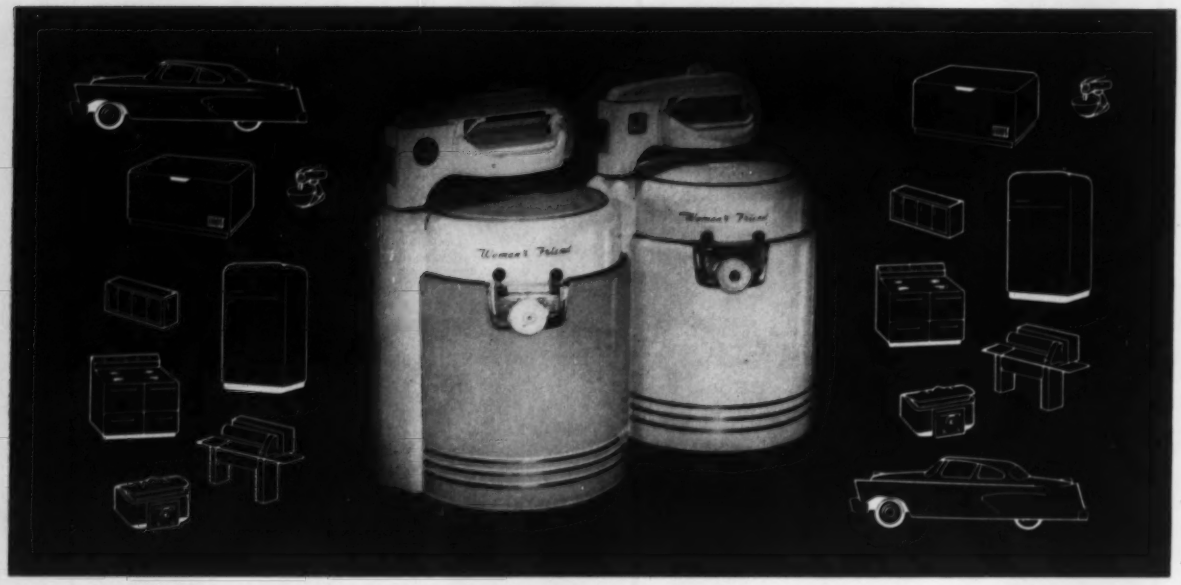
WELDING ANSWER—Joining two deep-drawn steel sink wells into one double sink unit was a rough job at Southern Porcelain Co., Dallas. The joint had to be completely free of porosity for porcelain enameling. With a resistance mash welder, one inexperienced operator now turns out 110 units in a 50-minute production hour. One pass of a hand-operated grinder is all it takes to prepare the weld for finishing.

QUICK TESTER—When the American Petroleum Institute raised steel pipe testing specifications, it meant pipe producers had to take a little longer testing each length. To keep from buying another production tester, engineers at Pittsburgh Steel, Allenport, Pa., devised a low-cost setup for the added load. Quick-connect couplings with built-in check valves enable the operator to fill the pipe with city water, quickly switch to the small, high-pressure supply for testing, then disconnect and prepare for the next length.

PERFECT IRON—Continuing research by Westinghouse Electric Corp. has produced pure iron crystals up to 2 in. long and 0.001 in. thick. Earlier attempts produced crystals that could only be seen with a microscope. Now Westinghouse scientists are able to expand their activities in researching the fundamental properties of metals. This perfect iron, for instance, was found to have a breaking strength approaching 1-million psi, which is close to the ultimate strength predicted theoretically.

HIGH-TEMPERATURE FOAM—Low density silicone resin core materials with excellent heat stability, good electrical properties and low moisture absorption have been developed in Air Force-sponsored research. These foams have thermal stability for continuous use at 300 to 500°F, and intermittent use at higher temperatures. Thermal life is better than 300 hours at 500 to 600°F. Dow Corning Corp. did the research.

Metalworking Outlook—p. 59 *Market Outlook—p. 169*



RAINBOW'S REWARD:

Sales Appeal Starts With Finish

By ALLEN G. GRAY
Technical Editor

THE YELLOW washer outsells the white one 60 to 40.

Made by Central Rubber & Steel Corp., it boosted sales 300 per cent the first 14 months of its manufacture. For 18 months it brought $10 more on the market than the white one, although it cost no more to make. Both now sell for the same price.

Here's how the designer, J. M. Little, S.I.D., explains the initial price difference: "When the two washers were displayed together in a showroom, people would ask: 'How much more does the yellow one cost?' That was why we added $10 to the selling price at that time."

Points: People value finish; and they will pay more for one that suits their taste.

Clamor for Glamor — Today's buyers are looking for color and brightwork. They're looking for texture. They're looking for something new and exciting. That's why management has come to realize that finish often is the deciding factor in what Mr. or Mrs. America will buy.

There are shop problems, but sales takes precedence over ease of production.

Dominant—The master touch in finish today is color. Finish makers say the growth of color consciousness in the mind of the purchaser has been phenomenal within the last year.

"Our sales of materials for colored porcelain enamel increased 80 per cent in the last six months," says a leading frit producer.

Plating—The heavy influx of new plating machines is the best evidence that bright metal goes with good looks. Even on wrenches, a bright nickel-chrome finish is used in place of zinc to step up sales appeal.

New plating developments can lower finishing costs and still keep the brightwork sales appeal. New processes give leveling action to fill up mechanical finishing marks, improved ductility and more brightness in deposits.

Starts Here — Finishability is swinging a bigger stick when it comes to selecting metal for a part.

The Spotlight's on Finishing

Next week Cleveland will host the Industrial Finishing Exposition and the 42nd annual convention of the American Electroplaters' Society. Both exposition and technical sessions are scheduled for the Public Auditorium, June 20 through June 23.

The consideration may be platability, a factor in the use of zinc-base diecastings.

Or texture may be the deciding point. With aluminum, scratch brushing, satin finishing, sandblasting and tumbling can add an unusual twist to the decorative scheme.

Finishability may be an important factor in selecting stainless steel for its brightwork value, plus durability.

Different—Manufacturers looking for a unique finish will find more doors open than ever before.

A large paint producer showed STEEL a laboratory test panel coated with a simulated leather finish by a two-coat spray process. The first company to see it jumped at the chance to use it for its next models.

"Chemical polishing is a new approach to many finishing jobs," says William P. Innes, technical director, MacDermid Inc. Here are a few possibilities: Bright natural and dyed aluminum finishes, high luster on copper and brass parts. "It's now possible to chemical polish in conventional automatic equipment," says Mr. Innes.

Eliminate Polishing—High vacuum is the key to new finishes. One of the most promising: Diecastings. Given a lacquer undercoat, they can be given a smooth surface without polishing or buffing. Vacuum metallizing produces a bright shiny finish that looks like a highly polished electroplate. Protection is provided with a high quality topcoat lacquer.

Color, Too—Most topcoats can be dyed to brilliant reflective finishes in many colors. "We are making important progress in color stability and uniformity," says Gilbert King, National Research Corp.

"By controlled dip dyeing, a half-and-half effect can be achieved. For example, a fish lure is being made which is half gold and half silver. By proper treatment of the undercoat a wrinkle or satin finish is obtained," reports Mr. King.

There's more color in wire goods, too. One large fabricator of freezer baskets and shelves for appliance makers applies Unichrome cold dip plastisol coating in pastel shades of coral and light green.

Count This In—While taking full

A PAGE FROM THE AUTOMAKERS' BOOK

COLOR is no stranger to the automaker. He's well aware of sales records set since Henry Ford advertised "any color . . . as long as it's black . . ." Today, it's almost a case of any color as long as it isn't black.

But the rash of "eastery egg" colors in automobiles doesn't surprise Detroit. "We've got a way of predicting color trends by watching guideposts," explained one color specialist.

Here are some of them:

1. Check home decorating experts for color preferences in paints, fabrics and rugs.
2. Watch fashion magazines for color trends.
3. Find out which color combinations in retail packaging are selling best.
4. In good times, people seem to prefer brighter, gayer colors; darker colors, when money tightens up.

For example—Chrysler has an interesting case of a color selection that really paid off. In one of the woman's magazines, color experts spotted a Navajo orange that looked appealing. Sales and advertising said: "Let's team this with a sandy color and finish a hardtop just for display."

They did. Only people wanted to do more than look; they wanted to buy. Today, it's the sales leader for the hardtop line.

Cadillac has a similar story to tell about its Goddess gold and Alpine white hardtop.

Scientific, Too—Behind the corps of experts it takes to come up with the right esthetic and sales answers are color engineers. These men can calculate theoretically every shade imaginable. They've created indexed "libraries" of color which catalog thousands of different shades. From these studies have come some appealing color combinations once thought to be incompatible.

General Motors color engineers are completing a new type color scale. In it will be some 8000 different gradients, mathematically calculated throughout the color spectrum. When a stylist wants a tone three shades away from a perfect red, for instance, he will be able to go to the scale for the exact shade.

Color and Brightwork—In case you hadn't noticed, the brighter colors have started a design trend. There's more framing of color panels with bands of satiny-textured stainless or bright chrome plate.

The average car has 10 to 12 sq ft of bright work, not counting moldings. Producers are thinking more seriously about better plating quality.

As an example, Chrysler has a new spec on zinc diecastings for all 1955 models: Copper, 0.0003 in. min; nickel, 0.0008 in. min; total copper, plus nickel, 0.0012 in. min; chromium, 0.000010 in. On die-cast parts for 1954 models, nickel was only 0.0003 min; total copper, plus nickel, only 0.0008 in.

More Tones—The two-toned paint job, popularized several years ago, is fast becoming standard in spite of added cost. Now it's the three-tone that has the automakers buzzing.

Saleswise, this new color venture has produced an interesting trend. "Traditionally, the typical buyer has been a guy who considers the purchase carefully," confessed a Chrysler stylist, "but once he's made the decision, he wants his car immediately."

Now, in preference to taking a two-tone model right off the sales floor, the same buyer is perfectly content to wait three or four weeks for his three-tone paint job.

"It's the best proof we could ask for that color is a vital sales force," he added.

advantage of sales-winning appearance, don't forget finish quality can be the star salesmen for products, too.

Rely on the advice of your supplier. "Ask him if the color you want can be made with a pigment of maximum durability, keeping in mind the use the product will get." This advice comes from D. S. Gaarder, general manager, Industrial Sales Division, Sherwin-Williams Co.

Ask him about other properties. Regardless of the product, it must have a balanced finish.

This means some outstanding feature is not gained at the sacrifice of other necessary properties. A finish which has superalkali or salt spray resistance may not meet other requirements like flexibility, adhesion or color retention.

Under the Paint—The surface of fabricated parts must be free of oil, chalk, grease, drawing compounds, welding scale or just ordinary rust or shop dirt. All must be removed by proper cleaning before a top quality finish can be obtained.

Pretreating—After the metal is clean, there is opportunity to give the finish underfilm protection. Modern phosphating processes will convert a metal surface chemically so it is relatively insoluble, slightly roughened and passivated. It is in the best condition for finishing.

Cost—Take the average refrigerator: The paint finish costs $2 to $4. One estimate is that appearance protection by phosphating costs about 6 cents.

The auto companies count heavily on phosphate coating for underfilm protection. About all of today's cars are phosphated before painting.

Aluminum die castings can be finished in bright chromium plate, natural or dyed anodic coatings or by mechanical means

Cost is 35 to 40 cents for chemi-

How to Select the Right

1. Remember color goes with design; two halves make up the package. Both must be right.

"Finish is 50 per cent of appearance; shape is the other 50 per cent," says Jean O. Reinecke, chairman of the board, Society of Industrial Designers.

2. Consider the psychological effects of color.

Here are some pointers from H. H. Scheid, color consultant, Sherwin-Williams Co.:

Red is advancing and aggressive. Used judiciously, it is stimulating, lends sparkle. It is the No. 1 choice for boys' bicycles; for girls', it's blue.

Orange vitalizes mind and body. Because of its strange character—being a mixture of vibrant red and yellow—care must be exercised in its use.

Yellow is an exhilarating positive color. It's the safest for brightening up. Many schools use it in rooms for backward pupils. It's used on outdoor machinery, such as earth moving equipment. Being emetic in effect, it is not recommended for the inside of airliners, railroad passenger cars or busses.

Blue is cold, retiring and sedative. Although popular for men and women's clothes, that seems to be its place. It's negative and can be depressing. One manufacturer introduced a clothes washer in clear blue. Housewives objected; it was a reminder of "blue Monday."

Greens and *blue-greens* are refreshing, like ice, water and vegetation in the heat of summer. They have calming and balancing influences. Because of their suggestion of coolness, soft greens and blue greens are popular for electric fans.

Blue-violet is the most depressing color.

Red-violet is the dominant hue for pomp. It sparks the spirit.

3. Analyze the environment in which product will be used. Should it dominate or recede in its surroundings?

The home air conditioner is functional. Color should make it recede yet still attract the buyer. It should carry a cool look without clashing with other color schemes.

Machine tools for hobby shops take a gay trim in keeping with brighter decorating schemes of the workshop area which often is next to the recreation room.

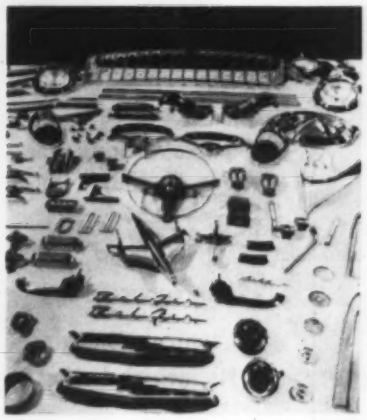
Other small machines use blues or blue gray, reflecting the more serious production aspects of the equipment. Large machine tools are standard gray.

Shades of gray or soft green are used on office equipment rather than more vivid colors to give the impression of efficiency. They lighten the working areas and do not show dust so readily as black.

4. Keep in mind how the product will be displayed.

Color is added on farm machinery for its sales promotion value. Harrow disks and plows may be finished in brilliant blues and reds. Large areas of yellow on its wheels make a tractor stand out when displayed with other farm machinery.

A medium-blue finish on an outboard motor is strong enough to stand out on the sales floor but dark enough so that nicks or scratches do not show excessively.



These bright chromium plated steel and zinc die cast parts are a portion of more than 600 plated trim parts used on the 1955 Chevrolet

cals and perhaps another 40 cents to apply it. This 80-cent investment protects a finishing job that may cost anywhere from $40 to $100.

Quality Plating—Here, keep in mind the limitations of the plating process. Have the designer check with the plater before a part is frozen. Often an insignificant loss in style will give a plated part higher quality and lower cost.

Curved surfaces on bumpers dictated design of a new plating machine Udylite Corp. built for Pontiac (STEEL, Dec. 20, 1954, p. 78). A nest of conforming anodes face the curved surfaces to give better plate uniformity.

Two-Way Job—"A duplex coating of nickel from two different solutions promises better bright plate corrosion resistance," says A. D. Squitero, chief chemist, Hanson-Van Winkle-Munning Co.

"The first bath will give leveling and ductility and will deposit a majority of the thickness. The second bath will be used to give brightness and will account for a small portion of total thickness," according to Mr. Squitero.

Modern processes for posttreatment of plated parts can do a lot to boost durability and help appearance.

Glass Tight—The protective features of porcelain enamel account for the great increase in its use. That's the word from the Porcelain Enamel Institute. Color is a plus, says William N. Brinker of the institute. "For some applications, porcelain enamel is the only finish that can give permanent color," he says.

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Color for Your Product

5. Consider the region in which the product is marketed.

From sales records, auto color stylists know that color preferences are sectional. For example, the South, Southwest and the South Pacific coast run strongly to lighter shades—more to soft tans and grays than other areas.

A large wall map of the U. S. in the General Motors color studio is divided into seven zones and into states showing current color preferences. It's updated regularly. It is important in selecting next year's colors in advance of production.

The yellow washer discussed on page 108 sold best in areas heavily populated with Negroes.

6. Keep in mind the age level of purchasers.

A portable typewriter for teenagers takes a brighter color than an office typewriter for adults.

Some 80 per cent of furniture is bought by newlyweds. They prefer color to drab finishes.

7. Appraise Use and Wear Factors.

End use often determines or limits color. Blues and greens show alkali marks readily on home laundry equipment. White and yellow resist them.

Deep colors are used on space heaters because of high temperatures. Light tones discolor. This problem is being overcome with silicone finishes which stand higher temperatures; some relatively light finishes can be used in heat applications.

Trend for many products is away from high gloss finishes. Mar resistance is better and wear shows less.

8. Consider surface condition of product being finished.

Finishes can be selected which hide surface defects. They help avoid costs of extensive surface preparation.

Surface condition is important in picking a color for home heating furnaces. Sometimes they have rough metal edges, weld marks and rivet heads which must be ground down. A hammered metal finish makes these irregularities less noticeable, especially in lighter shades owing to the higher aluminum content of the lighter colors.

Lower finish gloss helps camouflage metal imperfections.

9. Stick to safe colors.

"If you are getting into color, stick to a few safe pastel shades, at least at first." This is the advice of Carl R. Smedley, director of color research, Glidden Co., Cleveland. Pastels blend well with surrounding colors. On household utilities, for example, pink, turquoise green and yellow are good.

There's a lesson in the evolution of automobile colors: The first to outsell black was gun metal. Light greens and blues replaced dark greens and blues. Over the years the auto industry continued to lighten up the shades. Today, there's an array of strong pastels.

10. Take advantage of expert advice.

Many makers of industrial finishes maintain color research departments and offer scientific color-styling service. They have technicians who study how color can influence sales.

You can get answers to questions like: What single color shall I choose? What combination? What color will offer the best psychological influence? What colors will be popular when this product rolls off the production line?

MACHINING 1955

FORMING

This is the third in a series of articles on Machining . . . 1955. The first two covered turning and milling. Others will be on drilling and boring, planing and grinding.

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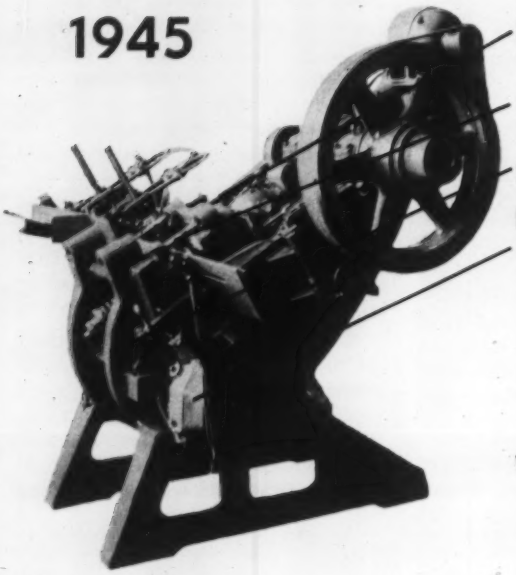


MEN WHO make a business of pushing metal around find themselves straddling two trends. One demands continually higher production. The other calls for cautious and sometimes severe forming of intricate and complicated parts.

Success with both can be traced to improvements and refinements in equipment, and to knowledge and experience gained in aircraft and ordnance work and in industry in general.

Production—Metal forming is a natural for high production. With a short, often one-swat cycle, a lot of parts can be made in a minute. Until wear takes over, every part comes out just like the one before.

With the normal press cycle automatic, once it's started, the switch to automation was an easy one. Small stamping presses often can be automated with a simple feeding device. A dial feed, for example, raised the output of one press from 2500 to 9000 stampings per shift for a maker of business machines.

Progressive dies on high-speed presses can work up to several thousand cycles a minute. A significant part of the faster press cycle has been the reduction of its nonwork portion. Operations, such as drawing, that require a slow action can be done faster now that only the working portion of the stroke is slow.

High-speed forming obviously is important to the producer of long, continuous runs, but what about the job shop? One expert told STEEL: "Automation for stock handling in and out of presses is economical . . . for relatively moderate runs. If job shops are to stay in business, they must install equipment that is modern in every detail, and at the same time devise handling methods that will keep their costs in line."

New Parts — Parts are being drawn to greater depths than were thought possible; intricate forgings are commonplace; and the stamping press is striking at stock several times thicker than "average."

One New England manufacturer is knocking out parts from a $\frac{5}{8}$-in. piece of SAE 4130 chrome-moly steel in one whack. Production: 100 parts and hour. The part used to be drilled and broached.

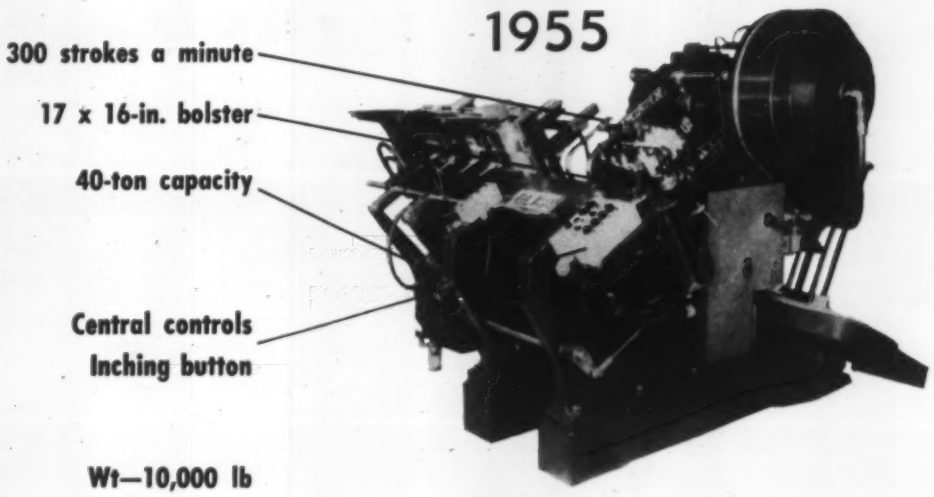
Competition—Forming is continually tightening its tolerances and tackling new shapes. Many forgings are made in two or three blows —tolerances of 0.015 are considered standard for some jobs. Such tolerances minimize later machining and put forging in competition with other production methods.

Complicated shapes are coming off the stamping line, many times eliminating fabrication of as many as 14 different components.

Spectaculars—Like other production operations, forming is facing the challenge of bigger workpieces. Tops in this line are the huge presses being built for the Air Force.

The program—now under way again—calls for four forging presses with a top capacity of 50,000 tons, and six extrusion presses with capacities to 14,000 tons. All are to be in operation this year.

They will be put to work on huge aircraft parts. How the giants will affect the rest of the forming industry remains to be seen. Most



men connected with the program, though, are betting that much will be learned that can be applied to civilian work.

The Squirt—Cold extrusion of steel is a relative newcomer to this country. Coming from Germany since World War II, it already has proved itself. The automotive industry is probably its largest single user.

It takes advantage of steel's ability to flow under compression. Dividends: Improved metal properties (due to cold working), savings in material when compared to machining, good finish and close tolerances.

One automotive subcontractor paid $25 per 1000 parts for stock when he was doing a job on a screw machine. Now he cold extrudes the parts at a cost to the customer of $32 a thousand—it includes charges for stock, profit, labor and overhead.

Turning — Another newcomer, flow turning, is a first cousin to spinning. A blank with the same diameter as the finished piece is flowed back over a mandrel. Wall thickness can be reduced by as much as 75 per cent.

The method is particularly good for severe shapes—can form many of them in one step, where they'd take a series of draws. It also offers the traditional forming trump cards of little waste, good finish and close tolerances. On one job a flow-turned part took a 65-lb blank; the previous method used a 369-lb forging. Material savings: $228 a part.

Reverse—Both plastic and flexible die members have moved in as standard forming tools, particularly in the aircraft industry. They've set a countertrend in forming — the move to small-lot jobs.

Plastic tools can be made for a fraction of the cost of steel dies, and they can be ready to run in a matter of days. Plastic dies for an outboard motor part were ready to begin drawing three weeks after the diemaker got the prints. The same type dies used to take the user 15 weeks to get; they cost three times more.

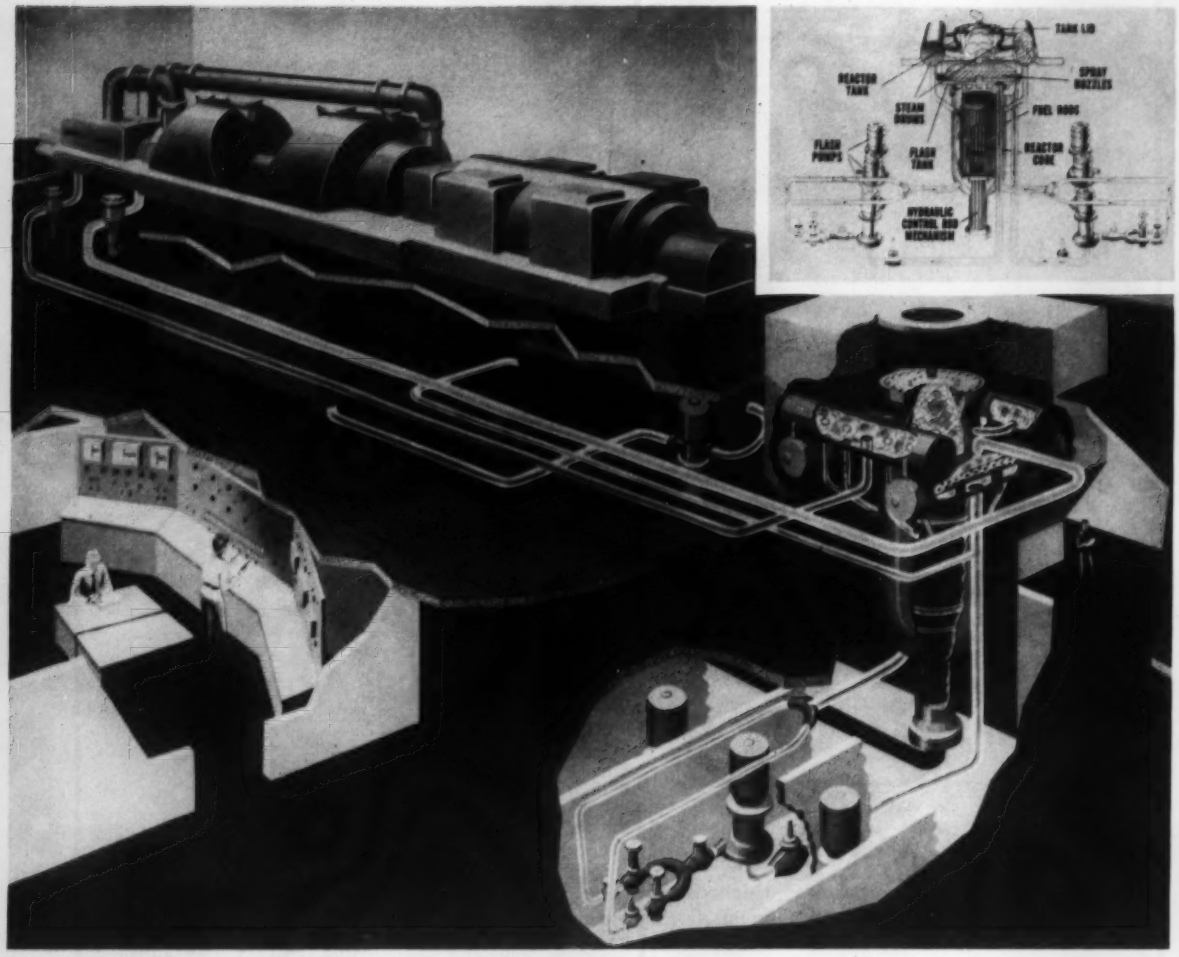
Plastic dies also have outdistanced many of their presumed limits. Originally, it was thought they'd last for only a few hundred or so parts. The motor builder above had drawn 15,000 parts at last report, with no sign of die deterioration. On other jobs, dies have run jobs several times that.

Soft Touch—Presses that use a flexible die member (rubber, neoprene, etc.) cut die costs by eliminating the necessity for mated dies. All that's needed is a form block—the flexible member conforms to the block. For some jobs, wood blocks can be used.

A second big advantage is the drastic reduction of subsequent handwork. In many cases, handwork has been eliminated.

Forging—Out of the tough ordnance jobs that forging tackled has come a new era of method. What used to be an art has pulled itself far from the "blacksmith shop"; it's a full fledged production technique.

The requirement of exceptional operator skill is being removed. In its place goes improved press design and, equally important, more ingenuity in die layout.



Dual-cycle boiling reactor narrows the gap for . . .

Competitive Atomic Power Plants

TIMETABLES for the development of cheap power from atomic reactors will have to be changed again. Thanks to General Electric's new dual-cycle boiling reactor, experts believe we have chopped off a sizeable interval of development time.

Subject to the Atomic Energy Commission's approval, the plant will generate 180,000 kw for Commonwealth Edison Co. in a Grundy county, Ill., power station. It will produce several times more power in a given size than its predecessor, the direct boiling reactor.

Take a Look—From the above drawings, it can be seen that the new reactor doesn't require heat exchangers. Steam is generated directly inside the reactor core, which means that the high operating temperatures and pressures used in water-cooled power reactors are unnecessary.

The inherent safety of the direct boiling reactor has been retained, without the disadvantage of output reduction during increased load demands. GE engineers introduced a "flash tank" system into the new reactor which controls steam formation by feeding cooler water into the entrance of the reactor as load demands increase. This maintains the delicate balance of the chain reaction, and the reactor automatically delivers more power to supply the load increase.

Two Pressures — The dual-cycle reactor in effect, accommodates itself to the demands of the power system without requiring changes in reactor controls. Steam is provided to the turbines at two pressures—600 psi from the reactor for the first turbine stages and 350 psi from the "flash tanks" for intermediate stages.

In contrast, the nonboiling reactors cooled by high-temperature, high-pressure water would require a pressure of about 2000 psi to generate steam at 500 psi for the turbine.

"Scientifically speaking — and from the practical side as well—the dual-cycle boiling reactor helps take industry past the pioneering stage in the development of practical peacetime use of the atom," said F. K. McCune, GE's vice president and general manager of its Atomic Products division.

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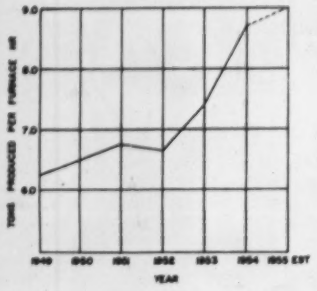

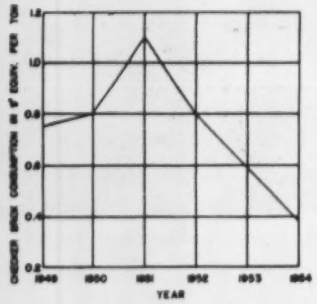

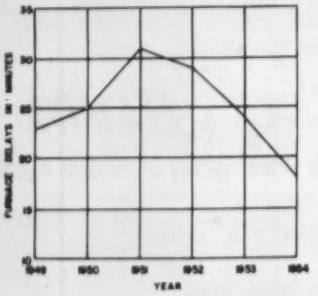

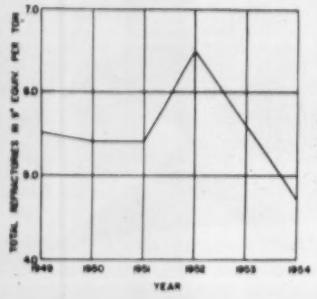

Get More from Your Meltshop

Bethlehem Pacific Coast did it without tricks or innovations, G. W. Teskey Jr., reported to the AISI at its March meeting in San Francisco

WHEN you've increased by 45 per cent the average tons per hour rate of a cold metal open hearth shop, everyone wants to know the secret. But when all the data were gathered, there weren't any innovations in the means used at Bethlehem Pacific Coast Steel Corp., San Francisco, to boost the output.

"It seemed at times that some new and startling development should become evident, but it never did," said G. W. Teskey Jr., open hearth superintendent. "As the survey progressed, it became apparent that no single factor dominates, rather it's a coordinated application of long-known rules and ideas," he added.

The Goal—The cold metal shop consists of five 75-ton furnaces with an annual rated capacity of 300,000 tons. Prior to 1950 the shop had inadequate ladle cranes which kept heat size below the furnace capacity. Larger ladles and minor pit changes did result in moderate increase in the shop's productivity, but what Bethlehem was looking for was increased production without further capital expenditure . . . not an easy task!

The initial approach seemed to involve increasing the amount of raw material charged without increasing the time to convert these materials. And, of course, this larger burden was not to consist of more costly materials. So, controlling material costs, Bethlehem engineers progressively increased the burden from 130,000 to 165,000 lb.

Cutting the Time — An obvious consideration in any attempt to cut conversion time is heat, therefore the average fuel input was gradually raised from 200 to 300 gal of oil equivalent per hour. To overcome the inevitable endwall erosion and overheating of the checkers, all of the fuel had to burn over the hearth. It could not be allowed to sweep across the furnace into the downtakes and checkers, as was the tendency.

A redesigned burner and a reduction of the furnace throat area added velocity to the gas-oil stream, promoting turbulence and better mixing of the fuel and preheated air. Throat area was decreased 25 per cent, burner dog-

VULCAN,
THE ROMAN GOD OF FIRE

When the ancient Romans heard thunder and saw lightning, they knew it was Vulcan, celestial smith of the gods, forging thunderbolts for Jupiter. Vulcan, patron of metalworkers, had his forge in the bowels of Mount Etna—and there are peasants in Sicily who still swear that Vulcan is at work when the volcano pours out lava.

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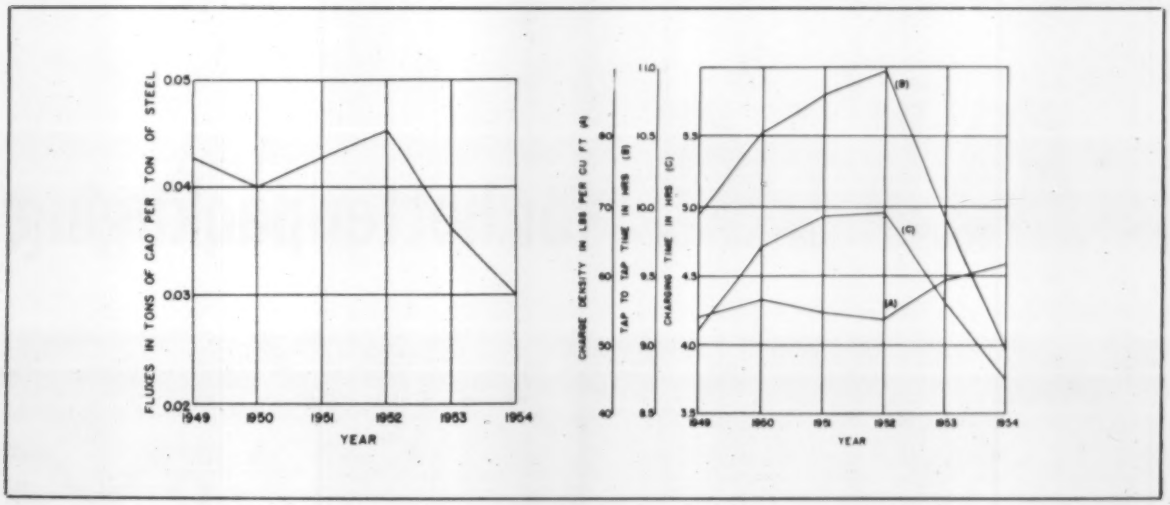


houses were eliminated and the burner was well withdrawn from the port block. Flame became sharper and more easily controlled, and there was much less tendency to burn endwalls and checkers.

Burners were also mounted on newly-designed brackets which permitted only limited changes of burner position. This minimizes the possibility of severely damaging the furnace through careless burner positioning.

Flame Damage—The new, more intense flame tended to increase skewback and tapping side roof erosion. This was overcome by increasing furnace pressure from a slight blow at the furthest door from the burner to a heavy blow at all three doors. A corresponding adjustment in the fan-induced combustion air flow caused the flame to burn lower in the furnace, increased the heat transfer at the scrap line and eliminated premature failure of the roof and skewback areas.

Tests were run to determine maximum amount of gas that could be fired. These established a ratio of 50 per cent gas, 50 per cent light fuel oil. A desirable further increase in gas must await further improvement and refinement in furnace and burner design.

Checker Analysis—The checker chambers in this shop are relatively small, having maximum heating areas of 10,000 sq ft and total volume of 2600 cu ft. Temperatures ran either too high or too cool and brick consumption was abnormally high. New temperature recorders that incorporated high temperature reversing switches proved optimum reversal time to be 10 rather than 15 minutes.

This reduction ended the overheating problems and yet increased the average temperature level in the furnace. Higher average checker temperatures, reduction in cold air infiltration by increasing furnace pressure, and more concerted effort to keep regenerators sealed have all provided higher preheat for the air.

Refractory Factors — From the refractory standpoint, it was decided that the optimum operation would be one requiring no downtime repairs during a campaign. This meant increasing slag pocket volume with a design that would have the same practical life as the furnace roof.

To get away from hot patching of the endwalls during a campaign, silica brick was used in the charging side bulkhead and a 9-in. panel of fired basic brick for the tapping side. The latter are reinforced with ¼-in. plates every other course.

Watercooled door frames were redesigned to improve their life, and rigid inspection of these frames was made standard practice at the end of each campaign. Trial involving different types of doors and linings resulted in an economical selection requiring a door change in mid-campaign and one at the end.

Operator Interest—While all of these closely controlled experiments were being conducted, operating personnel showed their interest in contributing to a more efficient shop. A more consistent pattern of operations was developed. Standards for bottom making, working a heat, and charging were formulated, and teamwork prevailed more strongly. "This cooperation of personnel and their acceptance of responsibility cannot be over-emphasized in a project of this kind," Mr. Teskey pointed out.

After the direct relationship of charging time to tap-to-tap time was illustrated, furnace men made a concerted effort in this area. A 25 per cent reduction in charging time with a corresponding 20 per cent reduction in total heat time was the payoff.

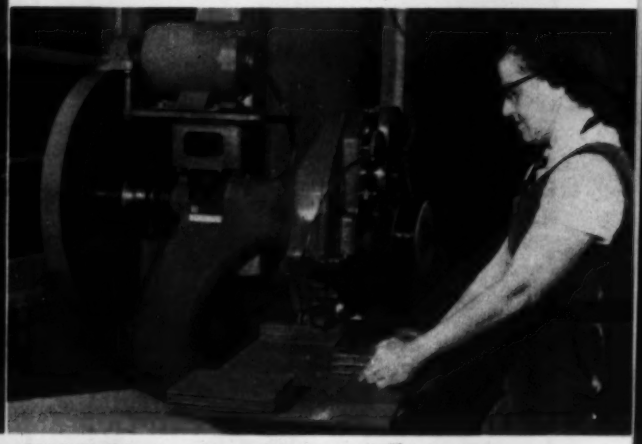
Minimum Flux — An important consideration affecting production, quality and cost is the flux burden. A standard minimum charge of lime and limestone has therefore been developed for each grade of steel produced. Due to the more rapid heat transfer through a thinner slag cover, a faster working period was obtained.

Summing up, Mr. Teskey cautioned that an entire open hearth shop cannot be immediately converted to incorporate some new methods of operation. "Because of the many interrelated variables involved, one or more campaigns are usually required to definitely prove the worth of any new concept," he added.

AIM for better packaging

AUTOMOTIVE—Gray iron castings are palletized for truck shipment. Storing and interplant handling are simplified. Idea No. 462.

FURNITURE—This packaging method and Acme Steel Strapping cut time and shipping weights over former crating methods. Idea No. 454.



CONTAINERS—Acme-Morrison Stitcher saves 25% in time over former gluing of corrugated interior packing. Idea No. 460.

METALWORKING—Acme Steel's famous Arcuate wire stitching method guarantees strong, safe closure of fibre boxes. Idea No. 456.

METALWORKING—Cooling blades for diesel intake fans are strapped on pallets with 2 to 4 straps for truck shipments. Idea No. 461.

and shipping ideas like these...and save!

APPLIANCES—Acme Steel methods assure safe transit by securely bracing carload shipments of home freezers. Idea No. 448.

WOODWORKING—Fast, packaging with F1 Strapping Machine that automatically cuts, tensions and welds Steelstrap. Idea No. 452.

These Acme Steel Strapping and Wire Stitching *ideas in action* are paying for themselves many times over in low-cost, damage-free shipments and satisfied customers.

Each idea shown here, and hundreds of others, are the result of close cooperation and intelligent application of methods and techniques between an *Acme Idea Man and the shipper.

Acme Steel *ideas in action* can be applied to packaging and shipping problems in virtually every industry. If there are ways to save time, money and materials, your *Acme Idea Man can help you find them.

He's easy to reach. Just call your nearest Acme Steel office—or fill out the coupon below.

ask your *Acme Idea Man

He can help you by...

ANALYZING your present packaging and shipping practices in line with modern systems that reduce costs and assure safe arrival.

DEMONSTRATING in your plant the strapping and stitching equipment best suited for your own products, your plant, your needs.

RECOMMENDING in specific terms the steel strapping or wire stitching methods that will provide the greatest savings to you and your customers.

ACME STEEL PRODUCTS DIVISION

ACME STEEL COMPANY

2840 Archer Ave., Chicago 8, Illinois

ACME STEEL

send for these valuable catalogs on Acme Steel Strapping, Strapping Tools and Wire Stitching equipment. Get the full story on packaging and shipping. Use the coupon.

ACME STEEL PRODUCTS DIVISION, Dept. CH-65
Acme Steel Company
2840 Archer Avenue, Chicago 8, Illinois
Please send me further information on Acme Steel's Safe, Lower-Cost Shipping Methods. I am interested in ☐ Steel Strapping; ☐ Wire Stitching; ☐ having an Acme Idea Man call on me.

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Company_____

Address_____

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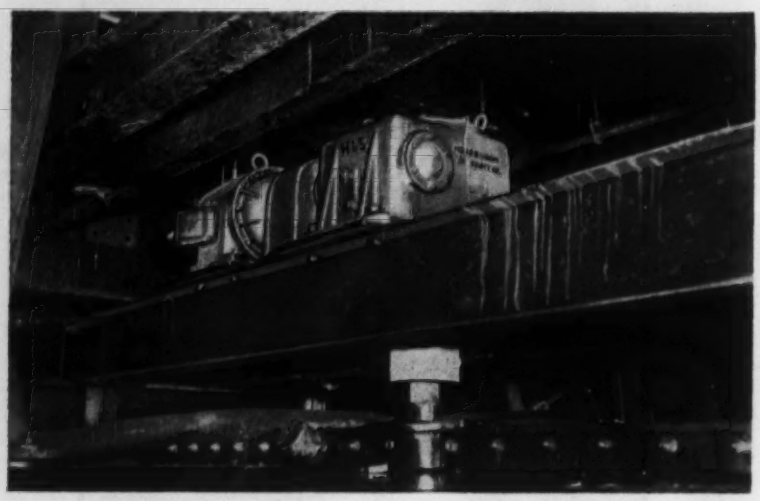
NO OIL LEAKAGE INTO PRODUCT

When H & S
Reducers Drive Chemical Agitator Tanks



The H&SWV Worm Gear Speed Reducer, with its original annular baffle surrounding the shaft and extending upward into a recess in the gear hub (well above the height of the oil level), *eliminates the possibility of oil leakage* down the low speed shaft. One example is illustrated above in a National Aniline plant. This dependable reducer finds wide use in driving agitators, mixers and assembly conveyors; for operating large valves in power plants, chemical plants and hydraulic stations, especially where remote control is used . . . also in applying power to jacks, tilting hoppers, car pullers, capstans, machine tools, and other equipment where vertical drive is indicated . . . up or down.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on Company Letterhead for 488-Page Catalog 49

Broaching Helical Gears

Production cost is low. Accuracy and finish compares to other methods

HELICAL external gears can be broached for about one-eighth the cost of hobbing them.

That's the result of a recent comparison on the cost of tooling up a plant to produce one of the helical gears illustrated, in quantities of 30,000 a day. The study was made by General Broach & Engineering Co., Detroit.

Economies — To produce the gear at that rate by hobbing would require an investment of nearly $2 million in machines and tools, the company says. The job could be done for $70,000 if the gear were broached. Later production costs also would be less with broaching, the company says.

The large initial cost differential is due to the lower cost of broaching machines and the fact that fewer machines are required.

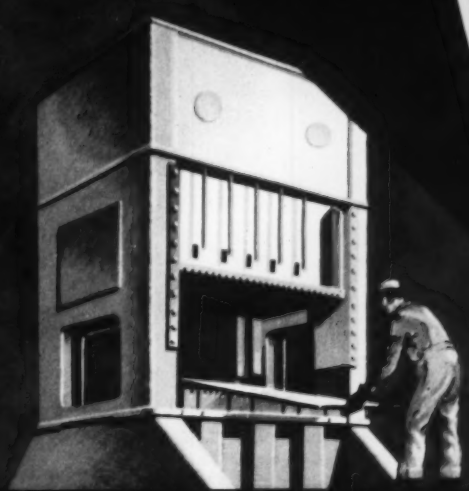
In a plant operated by General Broach, production rates of finished gears sometimes run 20,000 a day per machine. Recently, several long production runs were made by the broaching method with complete success.

BLANKS AND GEARS
. . . with broached helical teeth

Operation—Machines are loaded automatically, and at least one part is finished at each pass of the broach. It is possible to complete up to eight gears with a single stroke.

Tool design is an adaption of pot-type broaching which allows quick replacement of the individual broach teeth. As the blanks pass through the center of the broach, they are guided only by the broach and teeth and need not be center piloted.

This process, says General Broach, lends itself best to production runs of 50,000 or more gears, because of initial tooling cost.



Two Steels Are Fused By Jessop Skill To Bring You Better Dies At Lower Cost

One milestone in Jessop's drive for absolute supremacy in the realm of fine specialty steels is its unique ability to fuse together tool steel and tough, non-hardening carbon steel and then roll them into one solid inseparable die section. The advantages to this exclusive process are great. Forms resist shock better, and can be more readily shaped. Dowel and screw holes may be drilled after hardening, and cost per pound to you is up to 40% less than solid tool steel die sections. Whether or not you buy die sections, this Jessop "first" should interest you. A company that has the spirit and progressiveness to constantly search for new ways to serve its customers better is a good one to do business with. Send us an order for one of the specialty steels shown below.

STAINLESS STEELS • HIGH SPEED STEELS • NON-MAGNETIC STEELS • HIGH SPEED TOOL BITS • HEAT RESISTING STEELS • STAINLESS-CLAD PLATES • CARBON AND ALLOY STEELS TOOL STEELS FOR SPECIAL PURPOSES • CAST-TO-SHAPE TOOL STEELS • HIGH SPEED AND ALLOY SAW STEELS • TEMPERED AND GROUND STRIP STEEL • COMPOSITE HIGH SPEED STEELS • STAINLESS AND HEAT RESISTING CASTINGS • COMPOSITE DIE STEEL SECTIONS PRECISION GROUND FLAT STOCK • DIE STEELS—HOT AND COLD WORK

JESSOP

STEEL COMPANY · WASHINGTON, PA.

OFFICES IN PRINCIPAL CITIES

Jessop Steel of Canada Limited, Wallaceburg, Toronto

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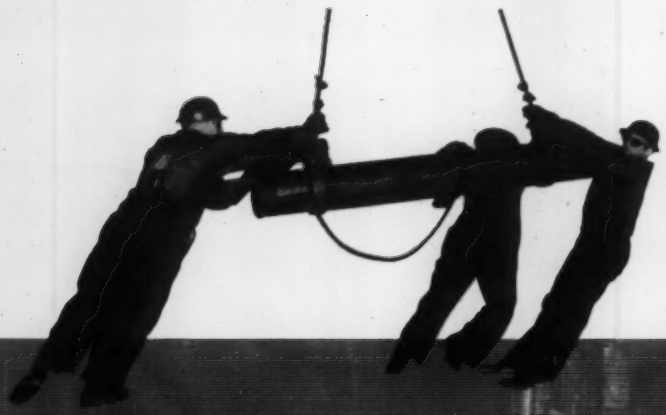
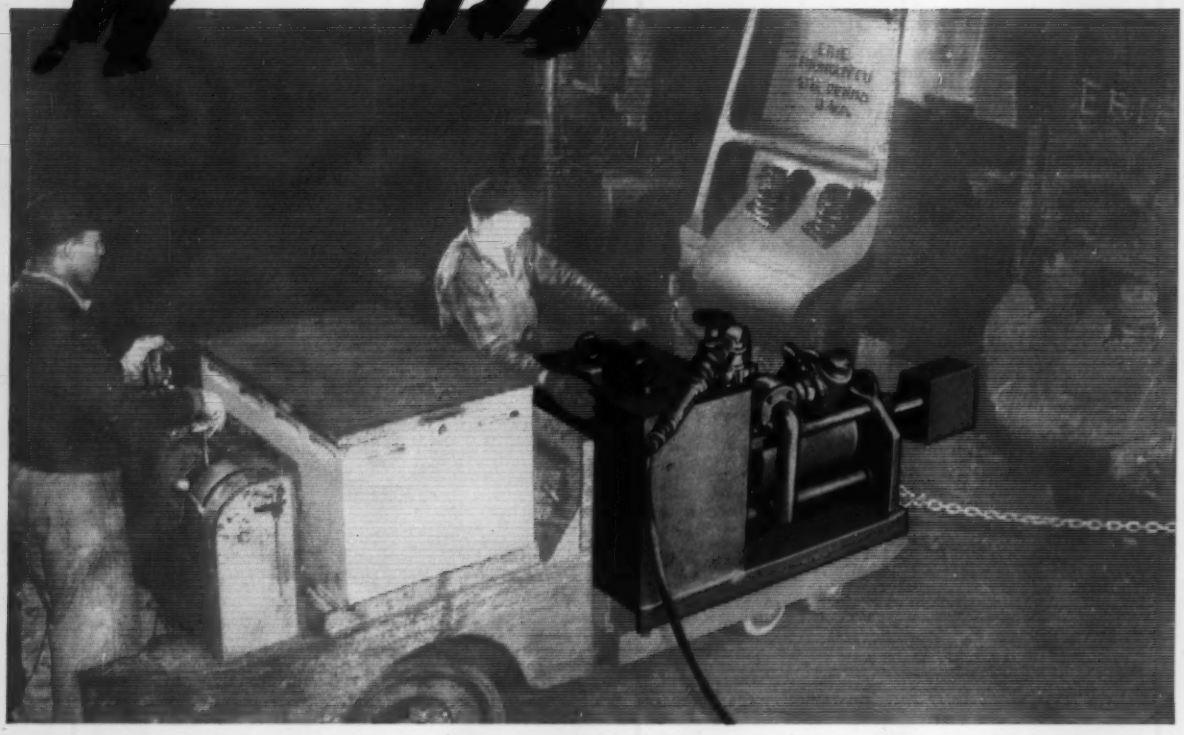


IF YOU ARE STILL LOSING 20 MAN-HOURS DRIVING KEYS . . .



THE NEW ERIE KEY DRIVER

lets you drive keys safely . . . . . in one man-hour

STOP DRIVING A SPIKE WITH A TACK HAMMER!

Now, when driving die and sow block keys in forge hammers, the new Erie Key Driver will do with *two* men in *15* minutes what used to take *5* men (don't forget the crane operator) several hours! Let Erie Foundry Co. show you how to save maintenance man-hours, eliminate wasteful down time, reduce accidents.

THE NEW ERIE KEY DRIVER IS SAFE

There's no danger of ram end-swing, no glancing blows, minimum mushrooming of keys. Every Erie Key Driver blow is true. One user says,* "The incidence of personal injury and property damage has been reduced to a relatively negligible nature by using the very efficient Erie Key Driver."

**Name furnished upon request.*

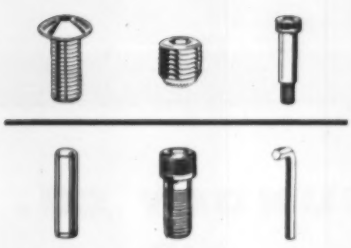
Write for Bulletin No. 356 today

ERIE FOUNDRY CO. ERIE, PA.

THE GREATEST NAME IN FORGE HAMMERS

ERIE

UNBRAKO AT WORK



FINISHING OFF WITH UNBRAKO FLAT HEADS. Holding a thin-section assembly together, and finishing it off with a smooth, good-looking surface is a job for UNBRAKO Flat Head Socket Cap Screws. These precision socket screws are designed for such applications. Heat treated alloy steel provides the strength. Uniform 82° angle under the head assures maximum contact. Accurate hex sockets prevent marring of the screw head or assembly surface. And these UNBRAKOS are easy to get—they are stocked by authorized industrial distributors everywhere. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION **sps** JENKINTOWN, PENNSYLVANIA

1

TWO SOLUTIONS TO THE CHALLENGING PROBLEMS OF

2

UNITED STATES PIPE & FOUNDRY CO.

Special Products Division

SPECIAL PRODUCTS DIVISION

BURLINGTON, NEW JERSEY

SALES OFFICES: LOS ANGELES, CHICAGO, ST. LOUIS, CLEVELAND, DETROIT, PITTSBURGH, HARTFORD, BURLINGTON

HIGH TEMPERATURE

SOUNDNESS AT 2150° F.

1 Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum — a test only the ultimate in soundness and quality could survive.

SURFACE AT 1400° F.

2 The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

"METAL MOLD" CENTRIFUGAL CASTINGS

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter	4" to 36"
Wall Thickness	3/8" and up
Length	Up to 16' in the "as-cast" condition
Type of Stainless Cast	All Standard AISI and ACI grades of ferritic and austenitic stainless plus "Special" types

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STEEL

REPLACES BRASS

for many machined parts!

Concerned about the rising costs of parts machined from brass? Investigate Super LA-LED . . the fastest machining steel bar ever developed.

. . Super LA-LED cuts material costs at least 50%.

. . Super LA-LED production rates approach those of brass.

Ask for your copy of descriptive brochure "Super LA-LED Replaces Brass."

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Hammond, Indiana

Manufacturers of the Most Complete Line of Quality Cold-Finished Steel Bars in America

Hose Passes Acid Test

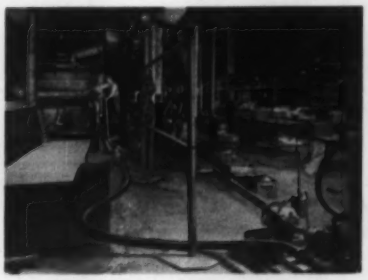
Completes 30 months of chromic acid service, two years of sulphuric, without failure

CHROMIC ACID is tough on hose. At Hilfinger Corp., Toledo, O., acid hose used to transfer chromic acid solution from plating units to storage tanks lasted only six to eight months.

In 1952 the electroplating firm installed a length of hose lined with Hypalon chemical rubber. After 30 months service, it shows no cracks or other signs of deterioration.

Workout—The hose is in constant contact with acid during the two-day cleaning operation every three months. It doesn't get flushed out until the 4400 gallons of acid have been returned to the plating machine.

Solution temperature runs about 105°F and concentration is 40 per cent acid by weight. Although Hilfinger pays about 20 per cent more for the chemical rubber hose, it already has cut replacement costs by 70 per cent.



CHEMICAL RUBBER HOSE
. . . transfers chromic acid solution

Other Acids—Equally good results are reported after two years of service in 98 per cent sulphuric acid. The new hose also has proved superior for handling 15 per cent sodium hypochlorite and 50 per cent sodium hydroxide.

Unlike ordinary rubber, Hypalon offers complete resistance to oxidation, and retains its properties after exposure to temperatures as high as 300°F. The chemical rubber is made by E. I. du Pont de Nemours & Co., Wilmington, Del. The hose used at Hilfinger Corp. was fabricated by Hewitt-Robins Inc., Stamford, Conn.

NEW B&W MULRAM 3200 degree Refractory Ramming Mix

More than two years service under tough conditions of slagging and metal penetration have proved the economy of B&W's new ramming mix, Mulram. Used to form monolithic refractory structures, B&W Mulram, which has a crushed fused-mullite base, is recommended for temperatures up to 3200 F. Its combination of low porosity and permeability, when installed, give Mulram the highest possible resistance to metal or slag penetration.

Not only is Mulram's permeability low, but it actually decreases from the hot face to the cold face. This means an *increasing* resistance to penetration through the thickness of the lining. Standard firebrick, on the other hand, have a higher and constant permeability through their thickness.

This combination of maximum resistance to slag and metal penetration and the 3200 F use limit are the chief reasons why B&W Mulram has given superior service in applications like these:

- **Barium chloride salt bath furnaces**
- **Linings for indirect-arc electric furnaces melting iron, steel or non-ferrous metals**
- **Forehearths or holding ladles for gray and malleable iron**
- **Runners and slagging basins on continuous cupolas**
- **Crucible furnace walls.**

B&W Mulram is being rammed into the bottom of this salt bath furnace. Furnace walls are formed with B&W Mulram, backed up by B&W's 3000 degree castable, Kaocast, and insulated with B&W K-20 Insulating Concrete Mix.

Even when penetration is not a serious problem, B&W Mulram often proves economical in such applications as burner blocks or burner tunnels because of its volume stability and high hot-load strength after proper firing. Standard Mulram is made in 4-mesh size, wet or dry form (Mulram 4W and 4D). Other mesh sizes are available for special applications. Call or write your local B&W Refractories Engineer for complete information.

B&W REFRACTORIES PRODUCTS: B&W Alumul Firebrick • B&W 80 Firebrick
B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars
OTHER B&W PRODUCTS: Stationary & Marine Boilers and Component Equipment
Chemical Recovery Units • Seamless & Welded Tubes • Pulverizers • Fuel Burning Equipment
Pressure Vessels • Alloy Castings

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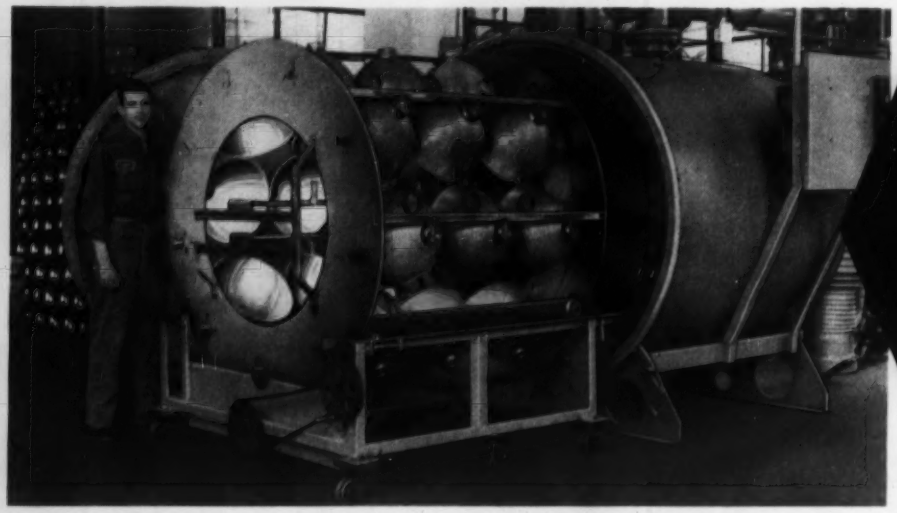
8838

Should You Use
VACUUM COATING ?

Would a Colorful Metallic Finish Add Sales Appeal to Your Product?
Do You Want a Metallic Finish on a Non-Metallic Product?
Would Vacuum Coating Cut Your Production Costs?



This NRC "Rapid Cycle" vacuum coater cuts unit finishing costs from $4.00 each to 95¢ each,

and, best of all, customers like the new product better.

NOW YOU CAN AFFORD COLOR

The gleaming, colorful metallic surface provided by vacuum coating is the answer to competitive demands for color where quality must be maintained, but pennies have to be pinched. Vacuum coating adds a bright shiny finish to metal, plastics and many other materials. The range of colors is virtually unlimited.

PRODUCTION SAVINGS

Buffing and polishing operations are eliminated. Inexpensive base materials can be used. There is no need for skilled operators.

THE GUESSWORK IS GONE

From experience in all phases of vacuum coating, we know that, spectacular as it is, vacuum coating is no cure-all. Tell us what you are processing now, and let us tell you whether you can benefit from this technique. If vacuum coating can help you, we'll supply you with vacuum-coated samples of your own product, in a selection of colors so that you can evaluate them for performance and sales appeal. We'll give you production rates and unit costs for coating your product. Provide a complete system engineered to your requirements. Install it, train your operators and stay on the job until it is operating to your satisfaction.

Send us the story on your operations today, or use the coupon to get more information.

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Please send me the "Rapid Cycle" Vacuum Coater Bulletin.

Name.....

Company.....

Address.....

City.....State.....

Flame Plating Cuts Costs

Sewing machine parts coated with tungsten carbide up service life six times

CAN YOU USE flame plating in your operation? This process puts a hard, wear-resistant coating on standard steel parts. Sewing machine feed dogs coated with tungsten carbide are cutting costs as much as 70 per cent.

A leading sewing machine user gets about a month's service from uncoated feed dogs when used on highly abrasive materials, such as burlap or canvas. When these standard parts are coated with tungsten carbide, they give him up to six months of service on the same materials.

Economy—A flame-plated part costs about 30 per cent as much as six dogs which are needed to obtain equal service life. Flame-plated feed dogs have a wear life comparable to solid sintered tungsten carbide parts, and cost only one-sixth as much.

FEED DOG
. . . with hard, wear-resistant coating

Developed by Linde Air Products Co., a division of Union Carbide & Carbon Corp., the flame method gives an almost welded bond between coating and base metal. The surface welding reaction at the interface is microscopic in depth.

Finishing—Because the temperature of the base metal does not exceed 400°F during coating, finished or semifinished parts can be coated with no dimensional or metallurgical change.

The coating may be left in as-coated condition (about 125 microinches rms), as in the case of the sewing machine feed dogs, or finished to 1 to 5 microinches rms for precise applications.

High Production Broaching

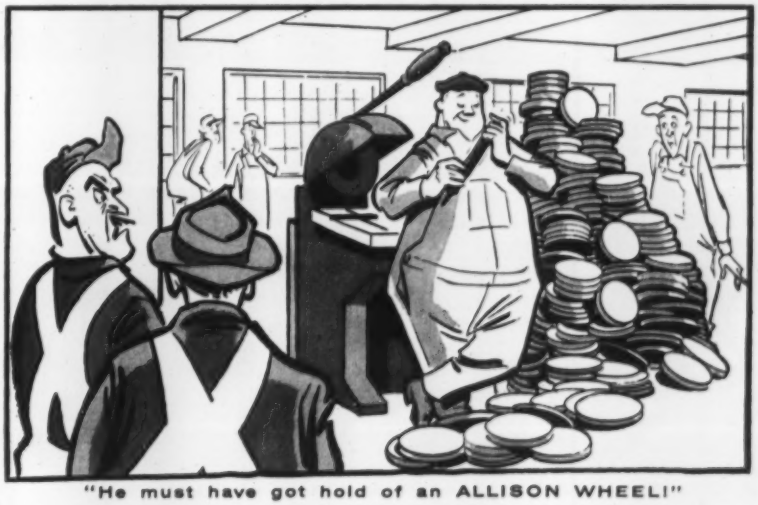
Adapting special tooling and chip removal facilities to a standard, Colonial, dual-ram broaching machine enables a large midwestern manufacturer to broach eight lugs on the face of a nozzle plate at the rate of 480 parts an hour.

Each ram of the machine has a four-station fixture. Eight parts are mounted during each cycle. Both fixtures locate, clamp and index the nozzle plates as part of the automatic production cycle. Four lugs on each part are formed during one cutting stroke. Parts are indexed 90 degrees and another set of four lugs broached.

The machines remove 168 lb of metal an hour. Since the unit is mounted in a pit, gravity coolant flow is used to wash chips onto a continuous conveyor at a point below floor level. Chips are conveyed upward to collecting bins.

Lug tolerances of +0.0005 in. and −0.002 in. are maintained.

cut your costs . . .
where you cut your materials



"He must have got hold of an ALLISON WHEEL!"

Many production managers have been happily surprised at the immediate jump in production when they switched to Allison Abrasive Cut-Off Wheels. This is evident not only in the increased number of pieces per hour, but also in the increased cuts per wheel and the higher quality of the work. The pay-off is more pieces per hour at a *lower cost per piece.*

There is an Allison Wheel to fit almost every job; cut almost every material. If you have a wet or dry abrasive cutting problem, ask Allison first.

the *best* way to cut many materials . . .
the *only* way to cut some.

Allison ABRASIVE CUTTING WHEELS

OTHER IMPORTANT ALLISON PRODUCTS

MASONRY ABRASIVE CUTTING BLADES
Ask for further information about Allison's complete line of wet or dry masonry cutting blades.

WHEELS FOR PORTABLE GRINDERS
Allison supplies the finest grinding wheels for portable grinder work.

THE ALLISON CO., 255 ISLAND BROOK AVENUE, BRIDGEPORT 8, CONN.
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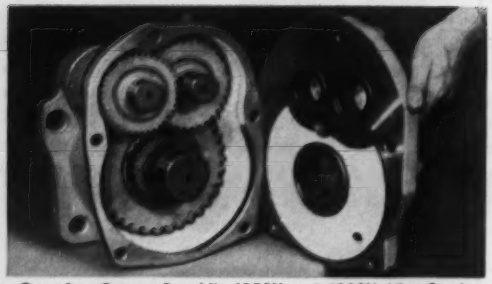
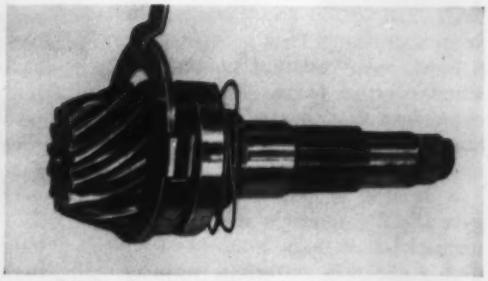
How you can put hundreds of

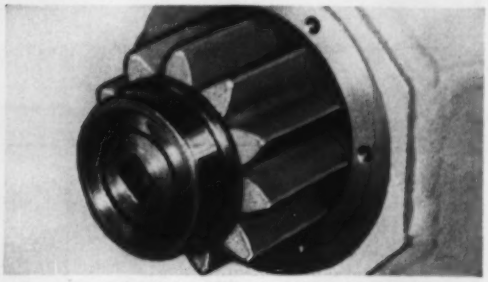


Gear Box Gears—Republic 4320H and 4820H Alloy Steels



Transfer Case Pinion—Republic 4820H Alloy Steel

Transfer Case Ring Gear—Republic 4820H Alloy Steel



Final Drive Pinion—Republic 4820H Alloy Steel

horsepower to work with safety

LeTourneau-Westinghouse does it with the help of Republic Alloy Steels on the Model B Tournapull. This high-speed, self-propelled scraper is designed to carry 23 yards of earth at speeds up to 28 miles per hour.

Republic Alloy Steels are used in this giant for final drive pinions, transfer case ring gear and pinion, gear reduction box gears and pinions, and electric motor pinions.

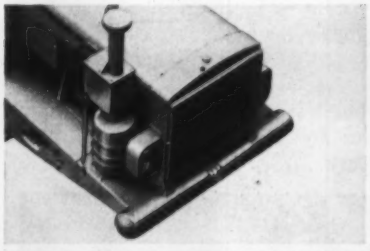
Alloy steels provide an outstanding combination of qualities essential to safety in designing equipment to carry heavier loads at higher speeds. In these fine steels you will find highest strength values—plus an unusually high strength-to-weight ratio that permits transmission of hundreds of horsepower through tough, strong gears and shafts free from excessive weight.

And when you add to these qualities uniform hardness, that means reduced wear—plus resistance to fatigue, shock, stress and temperature extremes—you have a material with the ability to insure safety, extend equipment life, and to cut maintenance and replacement costs.

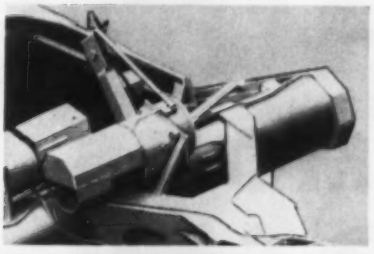
Republic—world's largest producer of alloy steels—is ready to assist you with metallurgical and engineering assistance in the most efficient and economical application of these fine steels to your product. The coupon will bring you more information.

REPUBLIC STEEL

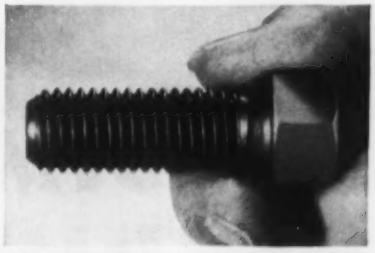
World's Widest Range of Standard Steels and Steel Products



ANOTHER REPUBLIC PRODUCT, Electric Resistance Weld Steel Pipe, is used for the front bumper on the Model B Tournapull. Both this type and Continuous Butt Weld Steel Pipe have been serving industry for years in all types of applications. Today they are better than ever. They have many mechanical applications, like the one shown above, in addition to being used for transmission of gas, water, steam.



PINS, BRACES AND REINFORCEMENTS on the Model B Tournapull are made from Republic Hot Rolled Carbon Bars. Countless forging and general manufacturing companies look to Republic as a dependable source for hot rolled steel bars. Rounds, squares, hexagons, octagons and flats are produced in all grades of carbon, alloy and stainless steels. Republic also supplies hot rolled special sections for economical mass production of steel parts.



REPUBLIC COLD FINISHED CARBON BARS are used by LeTourneau-Westinghouse for cap screws and bolts. Cold drawing gives steel parts higher strength, greater uniformity and a bright, smooth finish. Republic's Union Drawn Division supplies high-quality cold finished bars in all standard and special carbon, alloy and stainless analyses. And to get the most out of these steels, Republic offers you the services of expert metallurgists and machining specialists.

REPUBLIC STEEL CORPORATION
3120 East 45th Street
Cleveland 27, Ohio

REPUBLIC STEEL

Please send more information on:

☐ Alloy Steels ☐ Steel Pipe

☐ Cold Finished Bars ☐ Hot Rolled Bars

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

K-6967

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RIVET SETS · COMPRESSION RIVETER DIES

Made of highest standards and uniform quality thus insuring maximum service.

Since 1903

Large inventory of stock sizes of round punches and dies—also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

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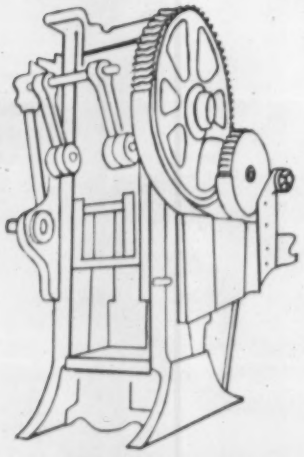

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SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

Unconditional guarantee . . . our standard since 1910

Flux Tells the Tale

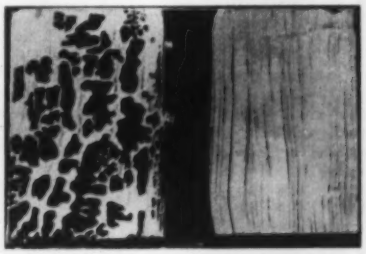
If a surface is too dirty to be wetted by flux, it won't take a brazing alloy

GIVEN a well-cleaned, fluxed surface, silver brazing alloys will wet easily and produce strong, leak-tight joints. Flux helps the molten alloy wet metals by reducing surface tension and removing oxides.

But unless flux wets the metal initially, there is little chance that the brazing alloy can do so.

Cleaning Aid—Flux will remove a certain amount of oil and oxide that commonly are encountered on mill-supplied materials. However, excessive dirt, grease, oil and oxides can retard wetting by both the flux and alloy.

You often can tell if the brazing alloy is likely to wet by examining the way the flux adheres to a surface. In the photo, the left plate was oily. Note the fluxless islands. If brazing were attempted, the alloy would wet so sparsely that a mechanically weak and probably leaky joint could be expected. The right plate was cleaned and degreased. The flux completely wets the metal. Tests are by Handy & Harman, New York.



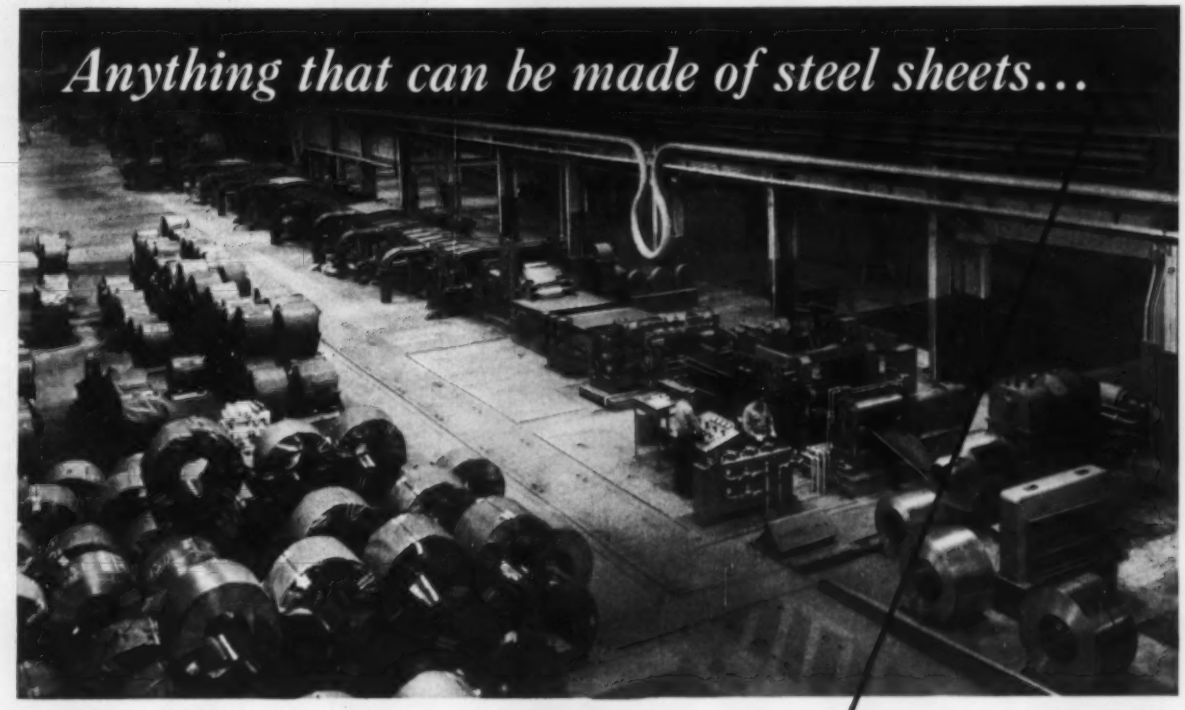
FLUX WETTING ACTION
. . . on dirty metal, and clean

How To Clean—If flux wets poorly, the wisest and most economical thing to do is to clean and degrease the pieces before attempting to braze.

Most common cleaning techniques are: Remove any oxide on the joint surface by pickling or by touching to an abrasive belt or wheel. Follow by decreasing in a bath of carbon tetrachloride, trichloroethylene or a similar solvent. When handling cleaned parts, do not touch the joint faces; a greasy fingerprint is as much of an offender as oil or oxide.

A CHALLENGE!

THE STRONGEST MADE BY ANY GALVANIZED SHEET:



...can be made of

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SOFTITE®

galvanized sheets

You are looking in on a miracle of modern engineering... Wheeling's new continuous galvanizing line, built at a cost of over $3,000,000.

The end result is SOFTITE, the galvanized sheet with the tightest zinc coating yet produced... so tight it won't flake or chip no matter what you do to it. So tight, you can use Wheeling SOFTITE to make anything that can be made of steel sheets.

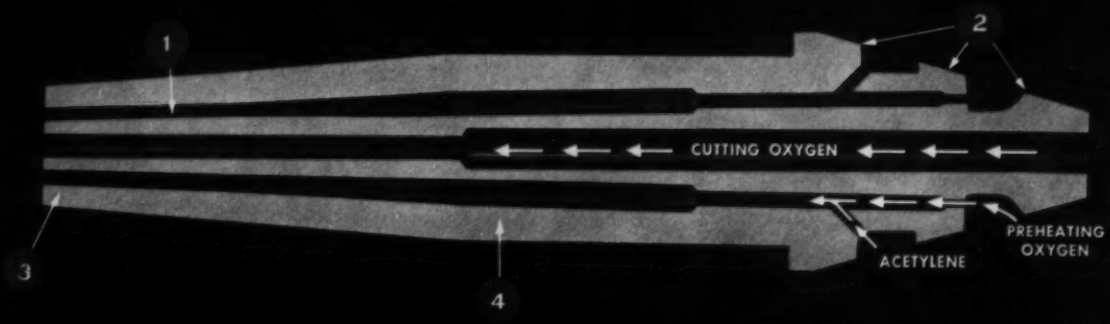
That's SOFTITE... *Wheeling* SOFTITE... made by the company that led with the development of COP-R-LOY, the original copper-bearing steel pipe, then perfected DUCTILLITE, the original cold reduced tin plate which revolutionized the tin plate industry, and opened new fields to the can maker and packer. Now, SOFTITE... acclaimed the best galvanized sheet yet produced—so good, in fact, that because of the unprecedented demand, Wheeling has been forced to triple its production facilities in 1955. SOFTITE, a product of Wheeling Steel Corporation, Wheeling, West Virginia.

IT'S WHEELING STEEL

DISTRICT SALES OFFICES—Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling

FIRST CAME **COP-R-LOY.®** THEN *Ductillite.®* NOW WHEELING **SOFTITE®**

AT THE FRONTIERS OF PROGRESS YOU'LL FIND...



Genuine Airco tips give you a better flame

Quality is built into *genuine* Airco tips from bar stock to finished product. Here's how:

1. **SMOOTH TAPER**—Gases are thoroughly mixed with reduced turbulence, producing a smooth, stable, long flame.

2. **POSITIVE SEATING**—Exclusive Airco self-centering design gives ample seating area... a gas tight fit.

3. **TELLURIUM COPPER**—Heat-resistant. Orifice edges stay sharp, concentrate flame.

4. **SAFE CONSTRUCTION**—Heavy walls give adequate safeguard against accidental damage.

And there are many other reasons for using *genuine* Airco tips, *made by Airco* for use on Airco torches. One advantage is Airco's 100% inspection: *every* tip is inspected and approved before it is shipped. For instance, every tip is purposely backfired to test for flashback. Also, every *genuine* Airco tip must pass the flame stability test... the ability of the flame to relight itself after being interrupted. So look for the name *Airco* on every *genuine* Airco tip. It means that the tip you buy is made by the manufacturers of Airco torches... and it is backed by Airco's experience and integrity.

For more complete information on all Airco torches and tips, contact your nearest Airco office or authorized Airco dealer. Ask for catalog 818.

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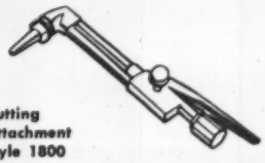
Products of the divisions of Air Reduction Company, Incorporated, include: AIRCO — industrial gases, welding and cutting equipment, and acetylenic chemicals • PURECO — carbon dioxide, liquid-solid ("DRY-ICE") • OHIO — medical gases and hospital equipment • NATIONAL CARBIDE — pipeline acetylene and calcium carbide • COLTON — polyvinyl-acetates, -alcohols and other synthetic resins.

(Advertisement)

AN AIR REDUCTION PRODUCT

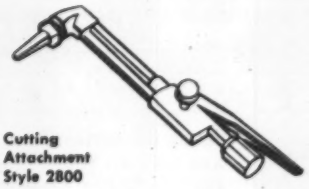
AIRCO items for welding and cutting

To convert an Airco style 800 general purpose welding and heating torch to a cutting torch, you need only add either the Airco Style 1800, or 2800 cutting attachment.



Cutting Attachment Style 1800

For medium duty work use the Style 1800. Available with either a 75° or 90° head, this attachment has a ⅝" tip seat to fit all Airco cutting attachment tips. Designed for cutting jobs from thin sheet up to 6" plate.



Cutting Attachment Style 2800

For heavy duty work, use the Style 2800. This attachment has a ¾" tip seat that will fit all Airco tips used with the Airco 3000 and 9000 series hand cutting torches. With this attachment, cuts up to 8" deep may be made. Like the medium duty attachment, the Style 2800 is available with either a 75° or 90° head.

WRITE AIRCO FOR LITERATURE ON THESE ITEMS

MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

DIEHARDS who gripe about the passing of machining as an art and resent the coming of machining, the science, aren't going to like this one.

The latest move to eliminate guesswork in machining is the electronic machinability computer just announced by the Carboloy Department, GE. It "considers" 14 variables. If you're interested in finding out what speed to use, for example, you feed the computer information on the other 13 variables, and out pops the answer.

Sales—Carboloy plans to put the computer on the market for about $500. At that price, the company says it'll do little better than break even. The units have been tested in other GE plants—impressed production men to the extent that GE has taken prior claim on the first machines.

Orders from other companies already are on the books. One big automaker looked at the computer and said his firm could use 500 of them.

Where — Certainly, the first customers will be the high-production plants where a little difference in machining efficiency means a big saving in production costs.

Just how far down the production scale the unit will be practical Carboloy engineers don't know. They admit they're shooting in the dark, to some extent, when it comes to market potential. What they do say, though, is that the computer works and will do a good job of improving cutting efficiency. Judging from orders and inquiries on it, they know it'll sell.

A Key—Dr. William Gilbert, developer of the computer, came to GE's manufacturing services division from the University of Michigan in 1954. He says the computer will: " . . . unlock the door between the shop and the laboratory and let basic metal cutting equations go to work solving shop problems . . . The computer makes it possible for anyone to solve these equations merely by turning dials representing the cutting conditions."

Tough Job—When Dr. Gilbert speaks of putting laboratory information to work in the shop, he's talking about a job that always isn't easy.

Most production men have ideas about how to cut metal. What's more, their ideas are right, but they're based on conditions that have grown obsolete—and some of the changes have taken place in the last year.

This raises the question: "How do you use information the labs are putting out?"

The calculator, and devices like it, are a big part of the answer. As production goes up, the answer becomes critical.

Business Makes Recovery

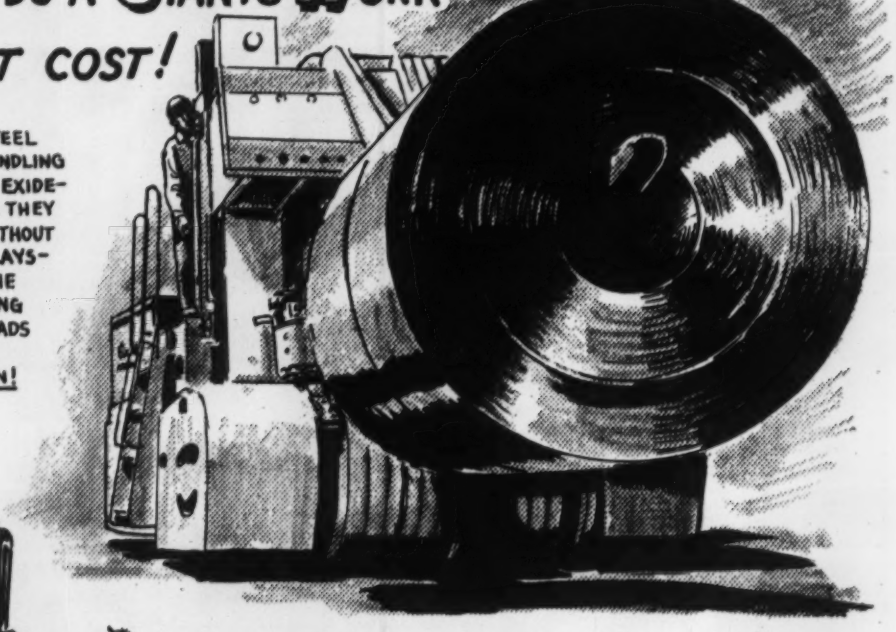
Although shipments for May will be about equal to those for April, new machine tool orders are expected to make a slight recovery, a group of machine tool builders told STEEL last week.

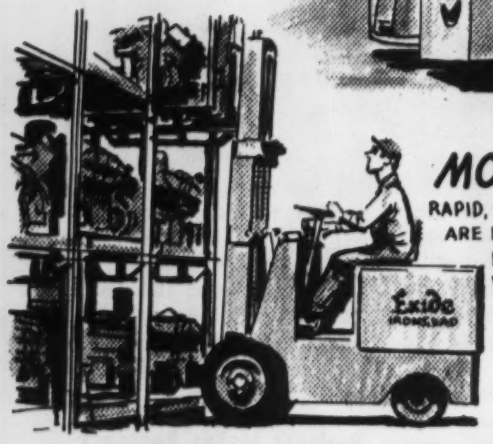
Influence—One reason for expected increases in orders: Many machine tool prices went up in May. This means there was some last minute rushing on the part of buyers to get orders signed before prices changed.

FACTS ABOUT Exide® INDUSTRIAL BATTERIES

IRONCLADS DO A GIANT'S WORK AT LOWEST COST!

MEN WHO WORK WITH STEEL SAVE BIG MONEY BY HANDLING BULKY MATERIALS WITH EXIDE-POWERED RAM TRUCKS. THEY WORK FULL-SHIFT--WITHOUT COSTLY DOWN-TIME DELAYS-AROUND THE CLOCK. THE DEPENDABILITY AND LONG USEFUL LIFE OF IRONCLADS RESULT IN LOWEST HANDLING COSTS PER TON!





MOVE MORE PARTS FASTER!

RAPID, ACCURATE HANDLING...PRECISE SPOTTING ARE EASY WHEN YOU USE EXIDE-POWERED ELECTRIC LIFT TRUCKS. STACK HIGHER AND NEATER-WITHOUT FUMES, NOISE, COSTLY DELAYS.

YARD TRAFFIC KEEPS ROLLING!

WHEN DIESELS USE IRONCLADS

QUICK, SURE STARTS. POSITIVE OPERATION OF CONTROLS. THAT'S WHAT EXIDE-IRONCLAD DIESEL STARTING BATTERIES DELIVER-LOW-COST POWER EVERY DAY FOR YEARS.

TUBES OF POWER

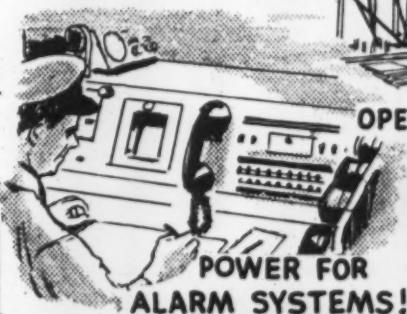
INSIDE EVERY IRONCLAD ARE SLOTTED TUBES THAT KEEP THE ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATES. THE ELECTROLYTE FLOWS EASILY THROUGH THESE NON-CORRODING SLOTS TO REACH MORE ACTIVE MATERIAL FASTER. RESULT: AN IRONCLAD DELIVERS GREATER POWER... FOR A LONGER TIME... AT LOWEST COST!

PROTECTED CONDUCTING GRID
COMPRESSED ACTIVE MATERIAL
SLOTTED RETAINER TUBE

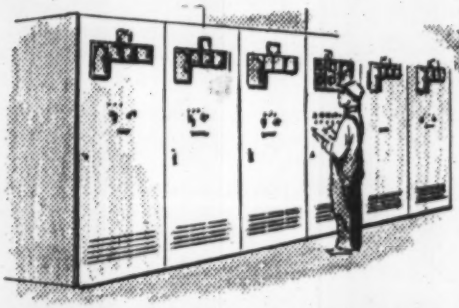
EXIDE-MANCHEX® PROVIDES ABSOLUTELY DEPENDABLE POWER FOR VITAL PLANT SERVICES

WHEN EMERGENCIES INTERRUPT THE NORMAL FLOW OF ELECTRIC POWER, PLANTS RELY ON AN INDEPENDENT—DEPENDABLE—SOURCE OF STANDBY POWER! THIS BIG JOB IS BEST GIVEN TO EXIDE-MANCHEX BATTERIES. THEIR INSTANT, AMPLE POWER DOES ALL FOUR JOBS—AT LOWEST COST.

OPERATES TELEPHONES!



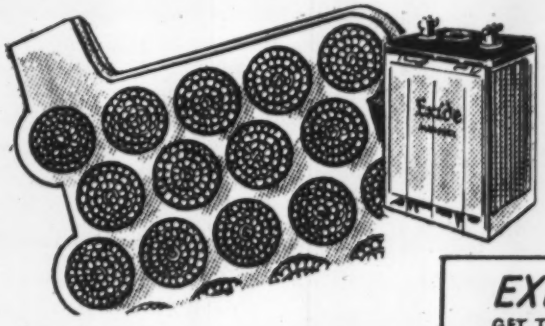
POWER FOR ALARM SYSTEMS!



KEEPS SWITCHGEAR WORKING!

POSITIVE OPERATION OF SWITCHGEAR IS THE MOST VITAL NEED OF A PLANT DURING ANY EMERGENCY. EXIDE-MANCHEX BATTERIES ASSURE DEPENDABLE SWITCHGEAR PERFORMANCE-PROVIDE INSTANT POWER FOR FAST TRIPPING-YET HAVE ADEQUATE RESERVE POWER FOR OTHER CONTROL CIRCUITS AND EMERGENCY LIGHTING.

INSTANT EMERGENCY LIGHTING!



BUTTONS OF LEAD

EXIDE'S MANCHEX BATTERIES GET THEIR DEPENDABILITY AND LONG LIFE FROM BUTTONS OF PURE LEAD INSERTED IN THE GRID OF THE POSITIVE PLATES. THEY GIVE YOU HIGH CAPACITY IN A COMPACT SPACE – UNUSUALLY LONG BATTERY SERVICE LIFE!

CALL YOUR EXIDE SALES ENGINEER FOR HELP IN SOLVING YOUR BATTERY PROBLEMS. SINCE 1889 EXIDE HAS BEEN HELPING THE METAL WORKING INDUSTRY DO MORE WORK EASIER...FASTER... AT LOWEST COST. IS EXIDE HELPING YOU?

EXIDE'S ULTRA START® BATTERY

GET THE ANSWER TO YOUR FLEET BATTERY PROBLEMS. THE ULTRA START IS EXIDE'S MIRACLE BATTERY THAT LASTS YEARS LONGER. ULTRA START HAS LASTED MORE THAN 170,000 MILES IN POLICE CAR SERVICE – THAT'S THE EQUIVALENT OF 17 YEARS' NORMAL DRIVING! *WHEN IT'S AN EXIDE, YOU START!*

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Trucks Fill Handling Gaps

MATERIALS HANDLING techniques get severe day-in, day-out tests at Ford Motor Co.'s 12,000-acre plant in River Rouge, Mich.

Converting raw materials to finished automobiles is a long and complex process, involving the swift and certain movement of materials between the plant's blast furnaces, shipping docks, assembly lines, machine shops, coke ovens and production foundry.

Equipment—Railroad cars cover more than 110 miles of track within the plant, carrying 50-odd kinds of steel and other metals. They move from loading docks to storage areas and from storage areas to foundry, blast furnaces and mill areas. Overhead cranes and conveyors service production and assembly lines.

Serving this massive railroad-crane-conveyor system is a fleet of electrical industrial trucks. They range in capacity from 2500-lb, operator-led, fork-lift and platform units to 30,000-lb, heavy-ram and fork trucks. Flexible and maneuverable, they range throughout the plant.

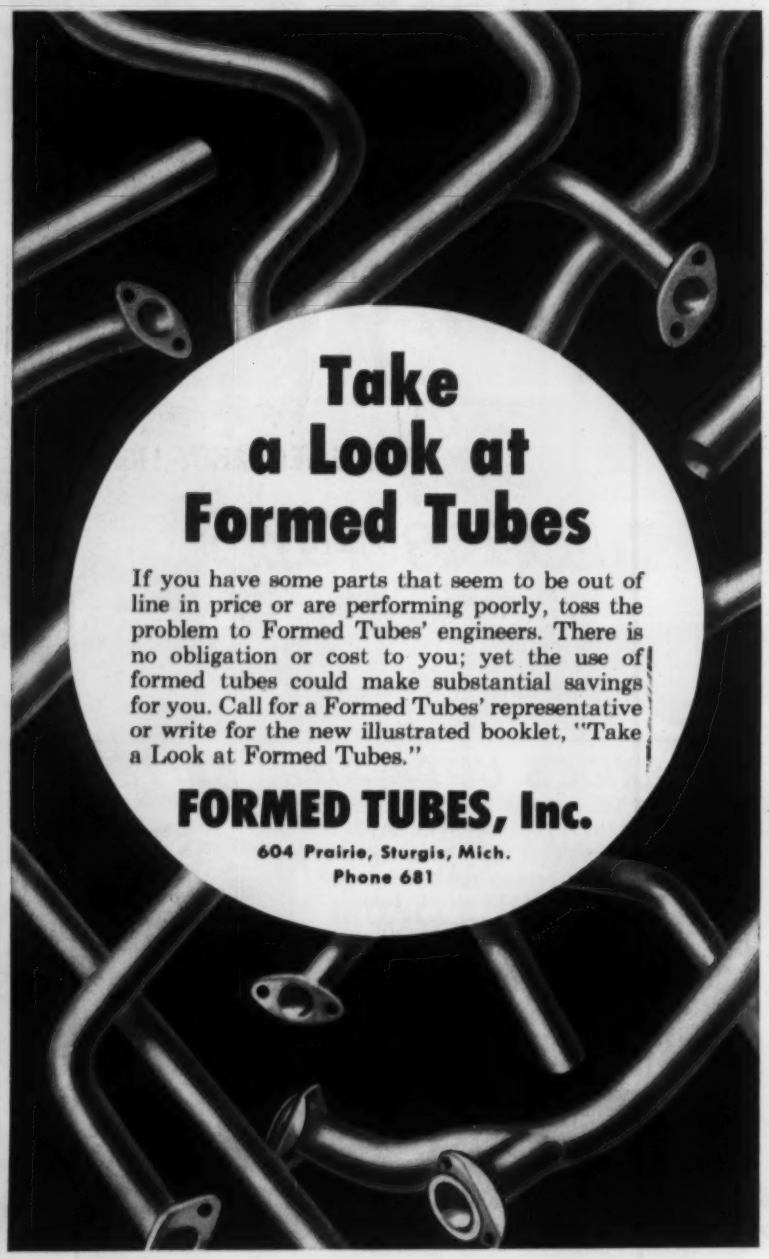
Cold-Rolling Mill — Heavy ram trucks provide needed flexibility. These units are not so limited as overhead cranes in lifting steel coils weighing 20,000 to 30,000 lb and carrying them to distant corners of the mill.

In a typical operation, a truck picks up a 27,600-lb coil of steel from a floor conveyor and carries it 75 ft to a skin pass mill. After the steel is processed, the truck again picks it up and moves it to the big shear or to the shipping department.

During slack periods, this unit banks storage stocks of steel in other areas of the mill and serves as standby equipment.

Stamping Plant—Main job of electric trucks here is to service presses and store flat or coiled steel stock. Each truck is fitted with adjustable forks, which, when closed, act as a ram to pick up coils weighing 12,000 to 15,000 lb. The operator directs the load to a spot accessible to a crane, which picks up the coils and carries them to an uncoiler for a blanking press. It is

Fork lift will roll-over clamp attachment services the production line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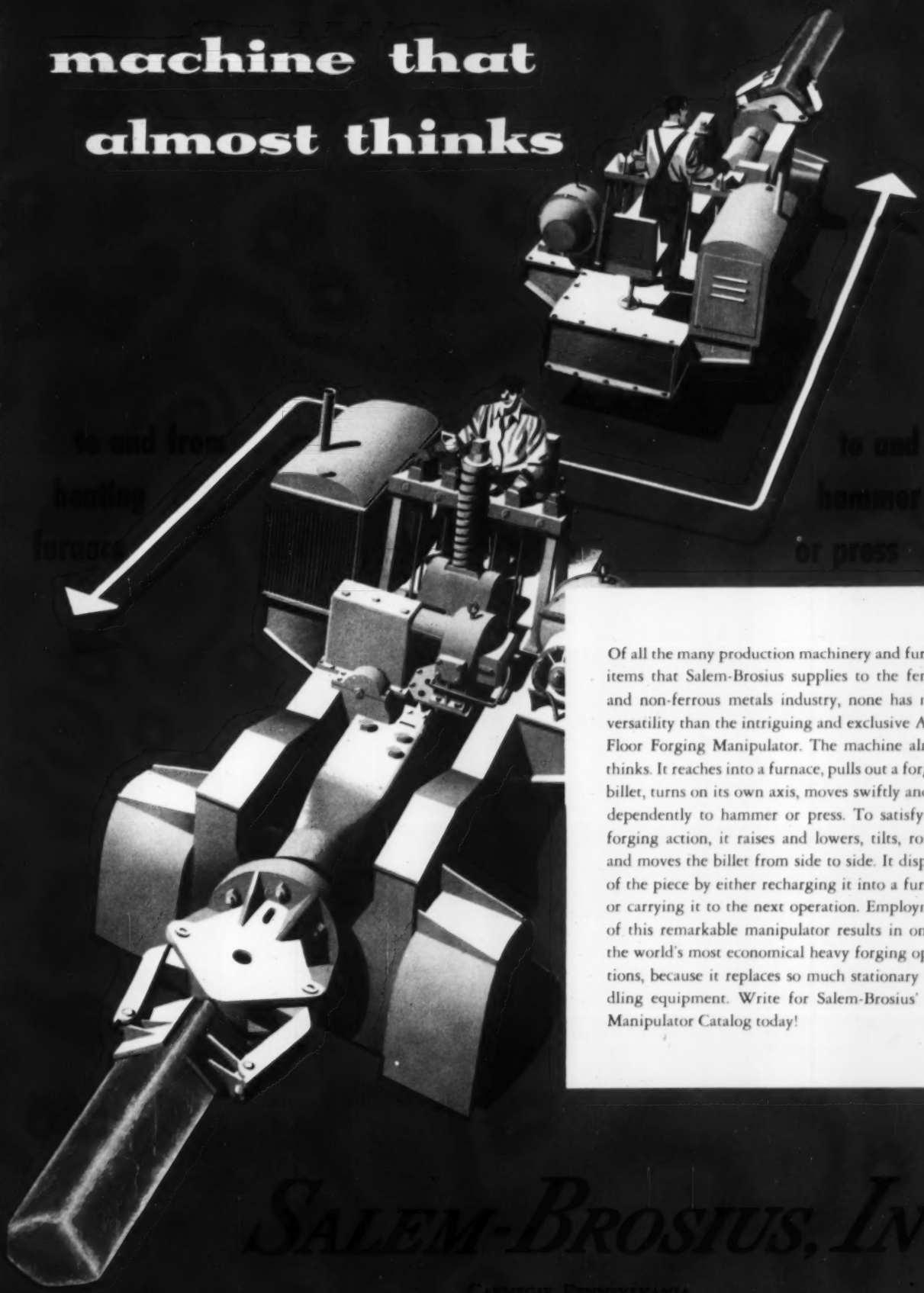
machine that almost thinks



Of all the many production machinery and furnace items that Salem-Brosius supplies to the ferrous and non-ferrous metals industry, none has more versatility than the intriguing and exclusive Auto-Floor Forging Manipulator. The machine almost thinks. It reaches into a furnace, pulls out a forging billet, turns on its own axis, moves swiftly and independently to hammer or press. To satisfy any forging action, it raises and lowers, tilts, rotates and moves the billet from side to side. It disposes of the piece by either recharging it into a furnace or carrying it to the next operation. Employment of this remarkable manipulator results in one of the world's most economical heavy forging operations, because it replaces so much stationary handling equipment. Write for Salem-Brosius' new Manipulator Catalog today!

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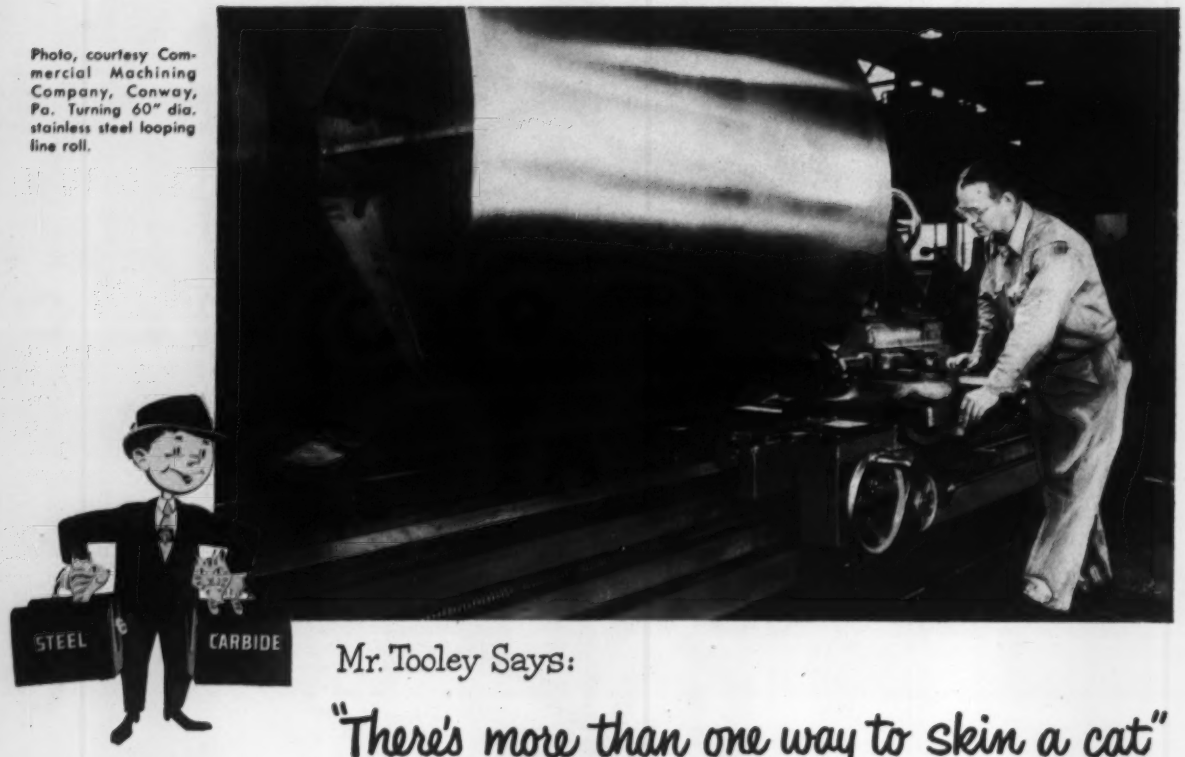
Photo, courtesy Commercial Machining Company, Conway, Pa. Turning 60" dia. stainless steel looping line roll.



Mr. Tooley Says:

"There's more than one way to skin a cat"

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- Longer tool life
- Cuts costs by increasing production
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STANDARD TIPS, TOOLS, INSERTS AND HOLDERS

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Yes, in the field of tooling, alternative cutting materials make it possible to utilize the same production equipment for a variety of applications. In typical turning operations either Firth Sterling High Speed Steel or Firthite Sintered Carbide cutting tools may be selected . . . depending upon the characteristics of the metal and the production requirements of the job.

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Both Firth Sterling's famous CIRCLE "C" Super High Speed Steel and FIRTHITE Sintered Carbide cutting tools and tips are used alternatively for most metal removal operations. Write now for literature and unbiased recommendations for your specific needs.

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not unusual for these trucks to place the coils in the uncoiler.

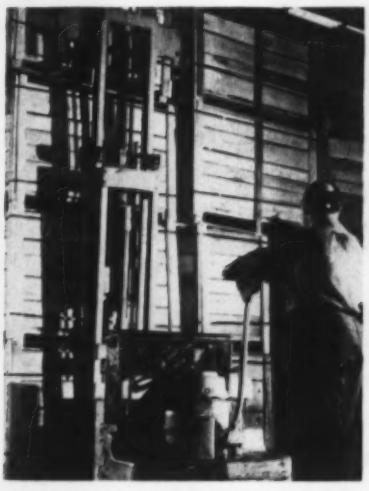
These trucks augment the crane and relieve it for heavier work, making for smoother handling, in addition to reaching areas not served by the crane.

Engine Shop—Materials handling becomes a delicate operation in this section of the plant. Floor vibrations must be kept to a minimum because of hairline precision machining. Operator-led, fork-lift trucks carry heavy parts without floor vibration.

These units handle unitized loads of ignition harnesses, gaskets, exhaust crossover pipes, fuel pumps, carburetors and distributor caps in close quarters. Highly maneuverable, the trucks service the production line and stack loads in tight storage areas.

Parts Division — Special attachments make electric trucks even more versatile in Ford's equipment and parts manufacturing division. Four 6000-lb capacity fork lift trucks have roll-over fork attachments. Another truck services die-casting machines with a special, die-handling attachment.

A typical unit supplies and feeds parts to drop-bottom bin boxes. Picking up skid boxes filled with parts, it carries them to the bins where the roll-over attachment goes into action, dumping them into the bins. Parts feed out at the bottom of the box at work-level height.



Operator-led stacker hauls small parts in the engine shop without causing floor vibration

Welding Manual for Engineers

This book by Harry Udin, Edward R. Funk and John Wulff offers the reader an explanation of welding as an art and a science.

Drawing on principles from physics, mathematics, chemistry, metallurgy and mechanical engineering, the authors emphasize principles rather than practice. Their purpose is to equip the engineer with information which will enable him to cope with a wide variety of problems encountered in welding.

Each welding process is detailed after its basic principles have been covered. More difficult processes are used for illustration as the book progresses. Where possible, an analytical approach is taken.

Welding for Engineers is published by John Wiley & Sons Inc., 440 Fourth Avenue, New York. Copies are $7.50 each.

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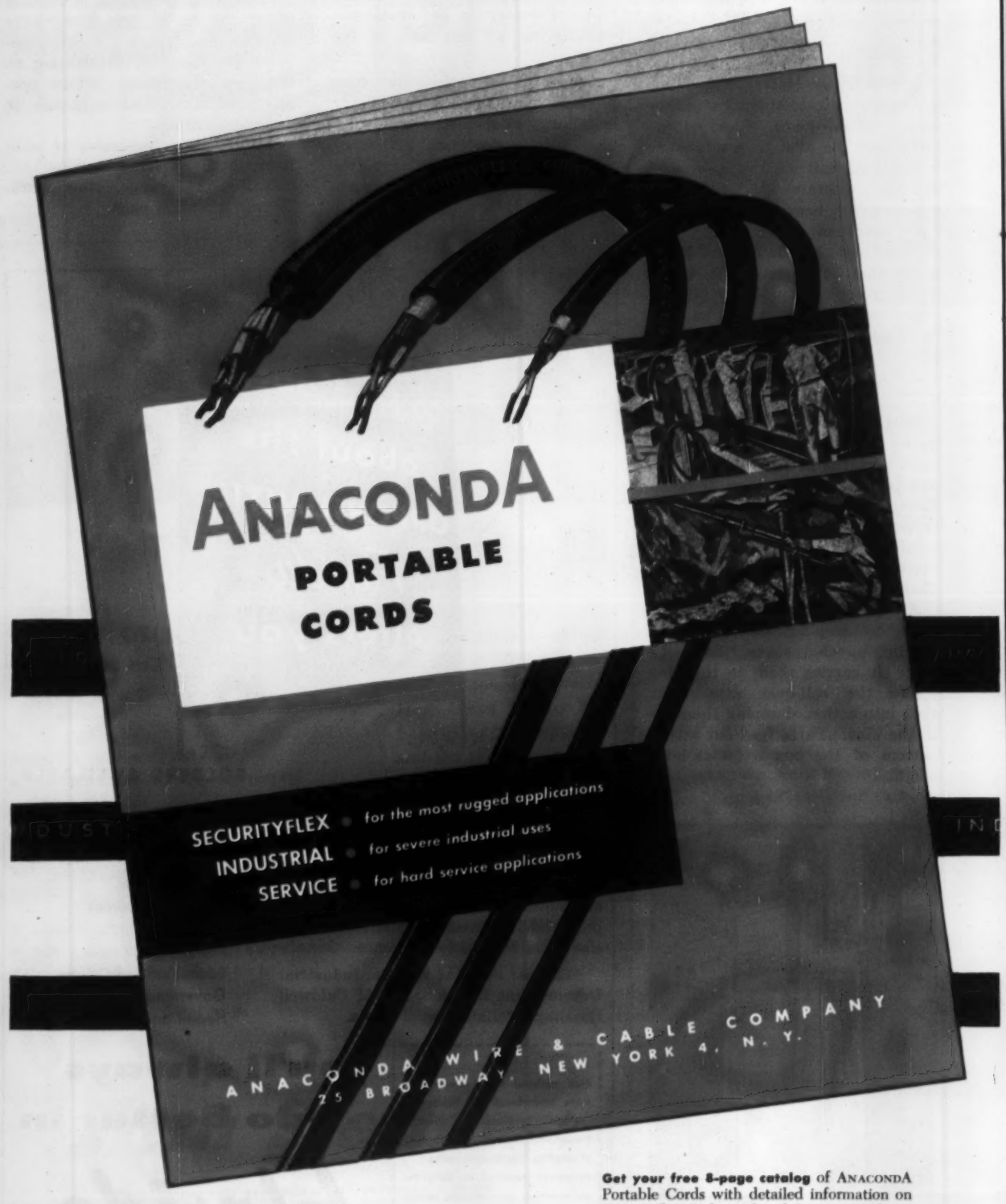

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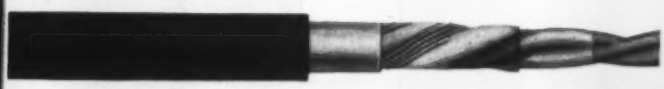
SECURITYFLEX–Underwriters' approved Types SO and SJO.

SECURITYFLEX* CORDS for severest conditions. Toughest, sturdiest cords made . . . used where strength and wear-resistance are a "must." Neoprene jacket *mold-cured in lead* gives top crush, abrasion- and oil-resistance. Cords pay for themselves with long life under severest conditions–in mines, railroads, docks, and in heavy industrial use. Look for the molded-in name, "Securityflex!"

INDUSTRIAL–Underwriters' approved Types SO and SJO.

INDUSTRIAL CORDS for heavy industrial conditions and *maximum flexibility.* Lower in cost. Specially designed for use in heavy industry–where cords are in continuous operation and must be tough, flexible, oil-resistant. Tough neoprene jacket. Many industrials stock this one cord for use in virtually all applications . . . reducing inventory problems and costs. Look for the Anaconda marking on jacket.



SERVICE–Underwriters' approved Types S and SJ.

SERVICE CORDS for regular duty. Lowest in cost . . . yet have many features found only in higher priced cords of other makes. Special rubber jacket withstands abuse and moisture. Outstanding for appliances, office machines, portable tools–where flexibility and long life are needed.

*Reg. U. S. Pat. Off. 55817

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ADDRESS .....

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A truckload of aluminum castings goes into heat treating furnace

HEAT TREATING ALUMINUM II

Castings

By W. A. ANDERSON
Aluminum Research Laboratories
New Kensington, Pa.

ALUMINUM ALLOY castings are heat treated to give them more strength and greater hardness. Thermal treatments also are used to reduce internal stress and give better dimensional stability at elevated temperatures.

As was brought out in Part 1 (STEEL, June 6, p. 83) the solid solubility of certain alloy constituents in aluminum is increased by solution heat treatment. After quenching, the alloy constituents tend to precipitate from solid solution as finely dispersed particles that harden the metal.

As shown in Fig. 1, alloys in the as-cast condition are not homogeneous. They have considerable alloy out of solution in the form of large particles that give little hardening. These constituents can be taken into solid solution by heating at high temperature. They then are available for precipitation hardening.

Commercial Rule — Castings are heat treated at temperatures close to the limits of solid solubility for the major alloying elements but below the temperature of the lowest melting eutectic (Table I).

Temperature as high as possible make for a high rate of solution and diffusion of the alloying constituents. Temperature must not go above the point where castings lose shape.

This is the second of two articles on heat treating aluminum alloys. Extra copies of both are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.

Time Element — A fairly long heating time is needed for homogenization of the alloy. Reasons: The coarseness of the cast structure and the great distances over which diffusion must take place (Fig. 1).

Permanent mold castings, because of their finer grain size and dendritic structure, require less solution time than sand castings.

Generally, castings are held at temperature for about 12 hours, although the exact time depends on foundry conditions.

Furnaces — Circulating air furnaces are used widely for treating castings. Electric heat often is specified. Furnaces designed so the products of combustion are circulated are satisfactory if the atmosphere has sufficient carbon dioxide and is free of sulphur and excess moisture. Temperature should be controlled to $\pm 5°$ F.

Castings are packed in steel baskets having racks designed for

free circulation of air and quenching water. To minimize distortion and sagging, parts should not be overcrowded or stacked too high in the heat treating racks. Some support may be needed for castings of intricate design.

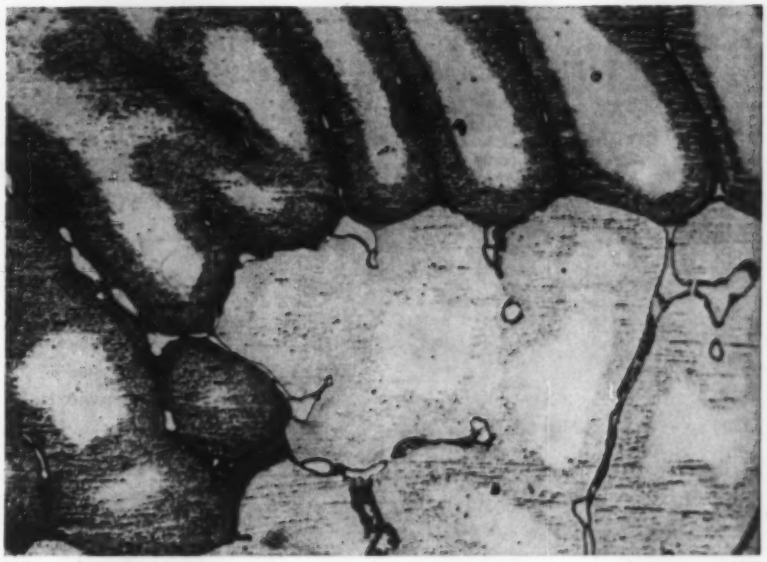
Quenching—Rapid cooling from furnace temperature is needed to give maximum properties. Generally, a boiling water quench is used.

Transfer of the load from the furnace to quench should be rapid. Castings warped by quenching should be straightened as soon as possible to take advantage of their higher ductility in the as-quenched (-T4) condition. Warped castings, to be artificially aged, should be straightened before aging.

Aging—In the as-quenched condition, the major alloying elements are in a state of supersaturation. The casting tends to reach equilibrium by rejecting the excess alloying element from solution as a fine precipitate.

This is age hardening. A curve for alloy 355 (Si 5.0 per cent, Cu 1.3, Mg 0.5) is shown in Fig. 2. Age hardening at room temperature is known as natural aging.

The rate of aging is greatly accelerated by heating (artificial aging) to moderately elevated temperatures. Proper choice of time and temperature results in a considerable increase in strength.



Keller's etch X100

Fig. 1—Aluminum alloys in the as-cast condition are not homogeneous as shown by the microstructure of this as-cast 195 alloy

Aging treatment varies with the alloy but usually is in the 300 to 400° F range. The time of heating also varies and should be determined experimentally from hardness tests or other measurements. Time will vary from a few hours to one day at temperature.

The "-T6" temper designates solution heat treatment, followed by elevated temperature aging.

Short-Cut—Sometimes, aging is done without prior heat treatment. Many castings respond because the rate of cooling after casting is usually fast enough to retain some alloying elements in supersaturated solid solution.

This treatment is used widely where strength requirements are intermediate between the as-cast condition and the more extensively heat treated tempers. This is known as the "-T5" temper.

Artificial aging at moderately high temperature also is used after solution heat treatment in cases where dimensional stability of the

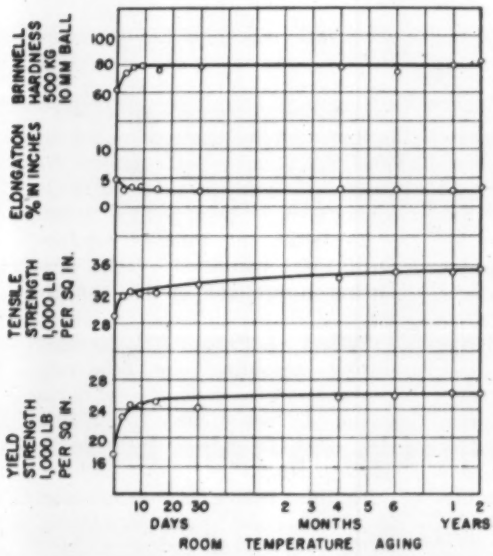


Fig. 2—How natural aging affects mechanical properties of sand cast 355-T4 alloy

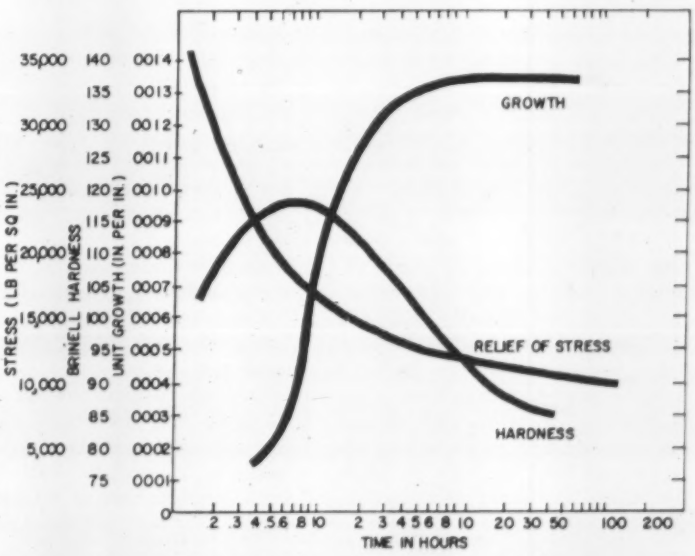


Fig. 3—Curves show how growth, residual stresses and hardness change with time in alloy 122 held at 435°F

Table I—Conditions for Heat Treating Aluminum Casting Alloys

Alloy (Alcoa)	Composition-Per Cent Cu	Si	Mg	Ni	Temper (Alcoa)	Solution Heat Treatment Time*	Temperature	Quench	Precipitation Treatment Time	Temperature
					SAND CASTINGS					
122	10.0		0.2		—T61	12 hr	950°F	150-212°F	10-14 hr	310°F
142	4.0		1.5	2.0	—T21				2-4 hr	650°F
					—T77	6 hr	960°F	air	1-3 hr	650°F
195	4.5				—T4	12 hr	960°F	150-212°F		
					—T6	12 hr	960°F	150-212°F	3-5 hr	310°F
					—T62	12 hr	960°F	150-212°F	12-16 hr	310°F
319	3.7	6.3			—T6		940°F	150-212°F	2-5 hr	310°F
355	1.3	5.0	0.5		—T6	12 hr	980°F	150-212°F	3-5 hr	310°F
					—T71	12 hr	980°F	150-212°F	4-6 hr	475°F
356		7.0	0.3		—T6	12 hr	1000°F	150-212°F	2-5 hr	310°F
					—T71	12 hr	1000°F	150-212°F	2-4 hr	475°F
					PERMANENT MOLD					
122	10.0		0.2		—T65	8 hr	950°F	150-212°F	7-9 hr	340°F
A132	1.0	12.0	1.0	2.5	—T551				7-9 hr	400°F
D132	3.5	9.0	0.8	0.8	—T5				7-9 hr	400°F
142	4.0		1.5	2.0	—T61	4 hr	960°F	150-212°F	3-5 hr	400°F
B195	4.5	2.5			—T4	8 hr	950°F	150-212°F		
					—T6	8 hr	950°F	150-212°F	5-7 hr	310°F
355	1.3	5.0	0.5		—T6	8 hr	980°F	150-212°F	3-5 hr	310°F
					—T71	8 hr	980°F	150-212°F	4-6 hr	475°F
					—T62	8 hr	980°F	150-212°F	14-18 hr	340°F
356		7.0	0.3		—T6	8 hr	1000°F	150-212°F	2-5 hr	310°F
					—T71	8 hr	1000°F	150-212°F	2-4 hr	475°F
333	3.8	9.0	0.4		—T6	8 hr	940°F	150-212°F	2-5 hr	310°F

* Soaking time is that required for average castings after load has reached temperature.

casting is important. Temperature varies from 400 to 500° F, depending on the alloy.

This treatment gives lower strength than the -T6 temper, but it decreases internal stresses and minimizes growth of castings used at elevated temperatures.

Castings given the above treatment are designated by the "-T7" temper. How the procedure affects the properties of alloy 122 (Cu 10.0 per cent, Mg 0.2) is shown in Fig. 3.

Technique—Castings usually can be stacked for aging without danger of sagging. They may be packed in steel baskets or racks. But it is important that spacing be allowed for free circulation of air and uniform heating of the load.

Aging temperatures should be controlled to ±5° F for best results.

Stresses—Here's another reason for thermal treatment of aluminum castings: Internal stresses. They are set up by unequal cooling rates in thick and thin sections.

Contraction against hard cores and inserts is another cause. Sometimes these stresses may cause warpage during machining.

Annealing—Heating for 2 or 3 hours at 600 to 650° F relieves these stresses.

Castings that are heated in service or operate at elevated temperatures may grow. This is caused by changes in density and volume from precipitation of alloying elements retained in solid solution during casting or as a result of solution heat treatment.

Usually these changes in volume are small—less than 0.15 per cent. But in some products even this amount of potential growth is objectionable. Dimensional stability is improved by heating to 400 to 500° F. This prevents growth by precipitating any large excess of alloying element from solid solution.

Electrical and thermal conductivities are increased by the precipitation brought on by annealing.

Suffers — Precipitates formed during annealing are relatively coarse and give little, if any, hardening. In some cases, annealing may decrease slightly the strength of the casting.

To differentiate between castings in the "as-cast" and "annealed" conditions, the temper designations "-F" and "-T2" are appended to the alloy numbers.

Less Spalling . . .

because Armstrong Insulating Fire Brick are made with exclusive cork "burn-out"

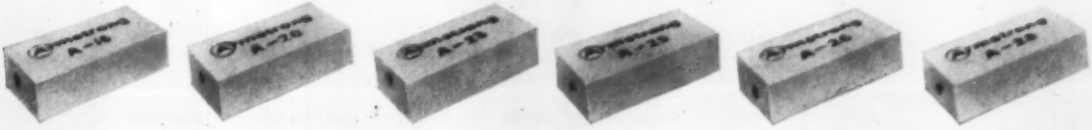
No appreciable spalling loss resulted when this test panel of Armstrong Insulating Fire Brick was subjected to the same test cycles.

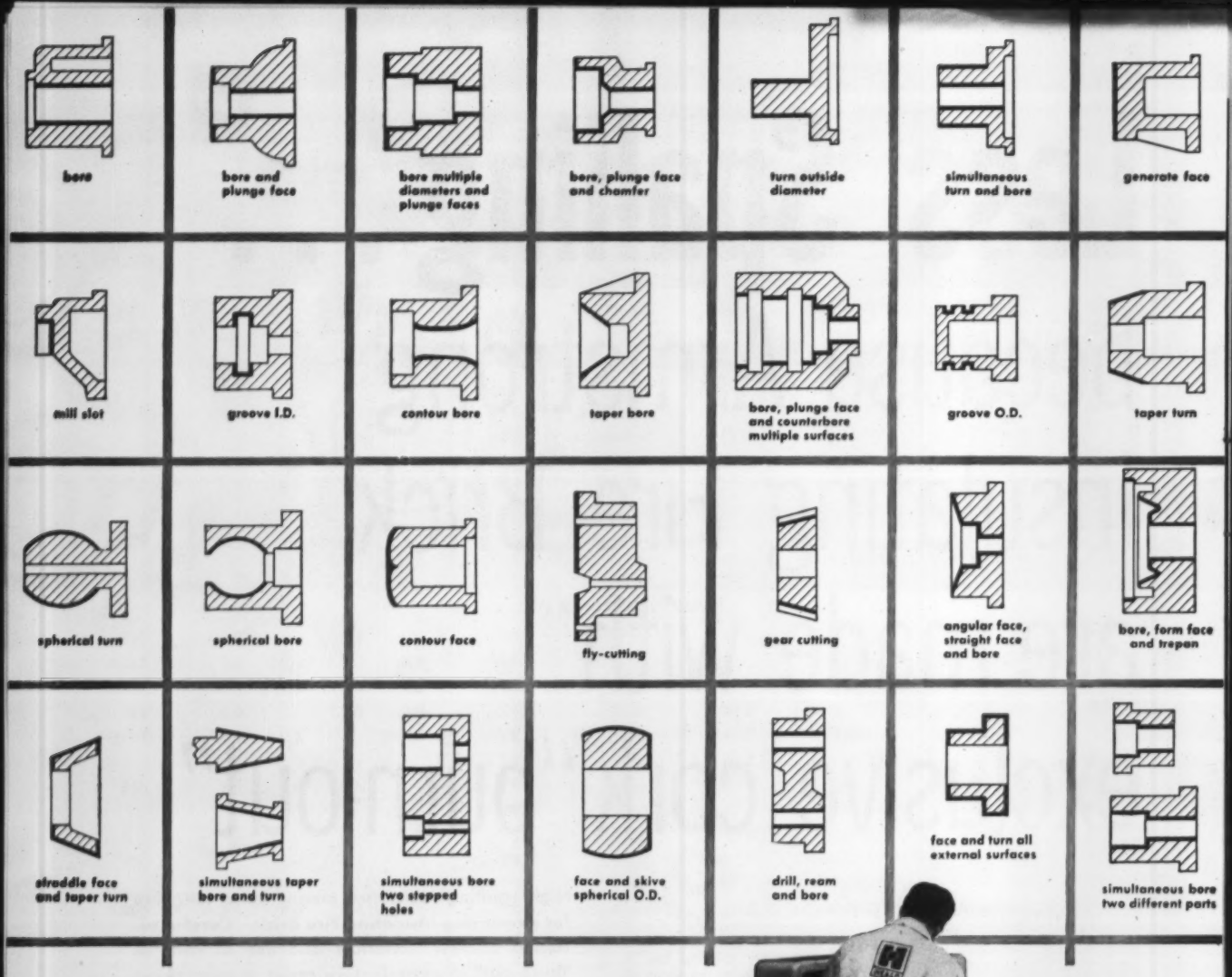
Considerable spalling loss is clearly visible on the panel of weaker insulating fire brick below that have been subjected to a series of heating and cooling cycles.

High spalling resistance means extra long life for Armstrong Insulating Fire Brick. Careful selection of raw materials and use of cork as "burn-out" in manufacture result in even firing throughout each brick, without laminations and internal strains. The result is insulating fire brick with exceptionally high resistance to thermal and mechanical shock.

Send for free booklet giving full details on the entire line of Armstrong Insulating Refractories. Just address Armstrong Cork Company, 2706 Reed Avenue, Lancaster, Pa. And next time you have a furnace lining or building job, call your Armstrong sales engineer for experienced help.

Armstrong INSULATING REFRACTORIES





which of these operations <u>can't</u> be done on a Heald Bore-Matic?

With one exception, all of the operations shown here, plus many more, are routine for a Heald Bore-Matic—a *single-end* Heald Bore-Matic using a *single setting*, as a matter of fact!

What's more, practically any of these operations can be *combined* in a single, high speed automatic cycle—finishing a variety of different surfaces, either simultaneously or in sequence, at a single setting. This fact makes a Heald one of the most *versatile* and *productive* precision finishing machines ever developed. As you have probably guessed by now, the one job shown that a Bore-Matic can't do to advantage is gear cutting.

Whatever your borizing problem, you'll find that IT PAYS TO COME TO HEALD!

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Surface Grinder Eliminates Planing Operation

This vertical spindle unit is designed for heavy stock removal on large die blocks or steel plates up to 54 x 144 in. It produces ground finish surfaces from the rough-rolled plate or forged die block.

All components of the machine are of heavy-duty construction to withstand the load generated by heavy grinding pressures with a 42-in.-diameter, segmental grinding wheel. The grinding wheel head travels hydraulically across the table.

The table is reciprocated by two opposed bronze-lined cylinders and steel pistons under sealed hydraulic oil pressure. *Write*: Hill Acme Co., 1201 W. 65th St., Cleveland 2, O. *Phone*: Olympic 1-2400

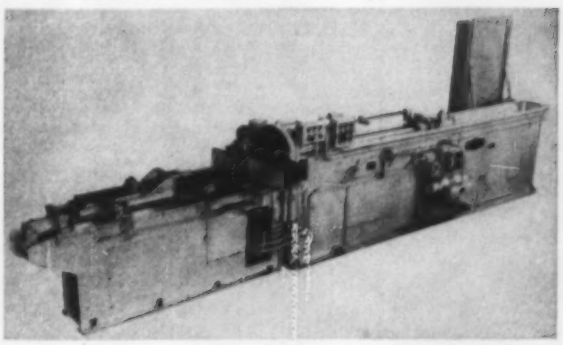
Four-High Mill Rolls Close Tolerance Strip

Designed to handle both ferrous and nonferrous strip up to 8 in. wide at speeds to 500 fpm, this mill will roll to less than 0.001-in. finish gage, holding a total thickness tolerance of 5 per cent.

Major feature is the backup drive method. It facilitates rapid workroll changing and use of different diameter workrolls. Rolls are offered in sizes from 2½ down to ¾-in. The mill is converted easily to a 2-high mill setup for breakdown and skin-pass rolling. In this arrangement, the large alloy steel backup rolls of the mill become workrolls.

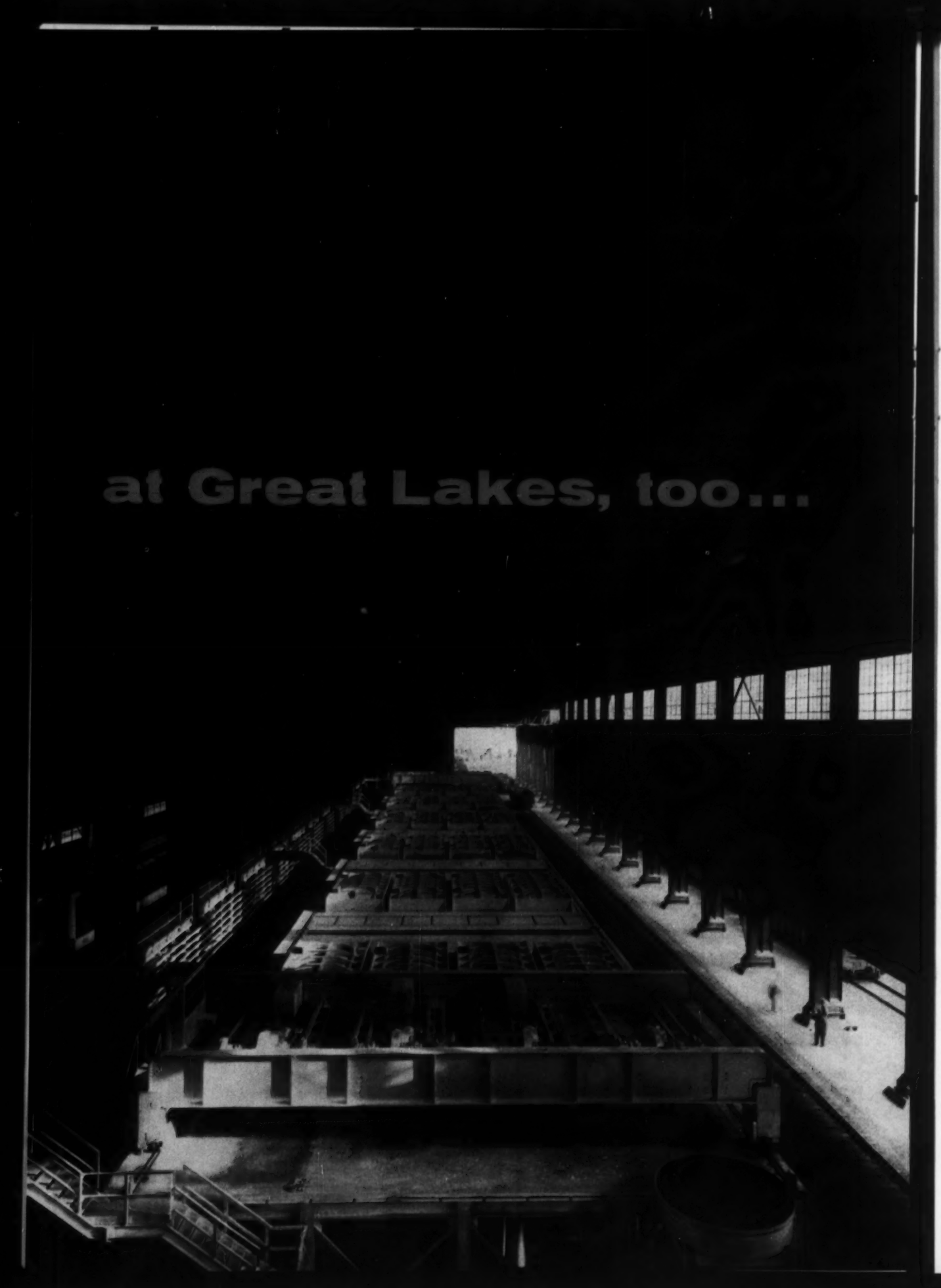
The mill is a self-contained and fully wired package unit requiring no foundation work. It can be operated as a one-way or reversing unit, using one or two individually motorized winding reels. Variable speed drives are available. *Write:* Stanat Mfg. Co. Inc., 47-28 37th St., Long Island City 1, N. Y. *Phone:* Ravenswood 9-2420

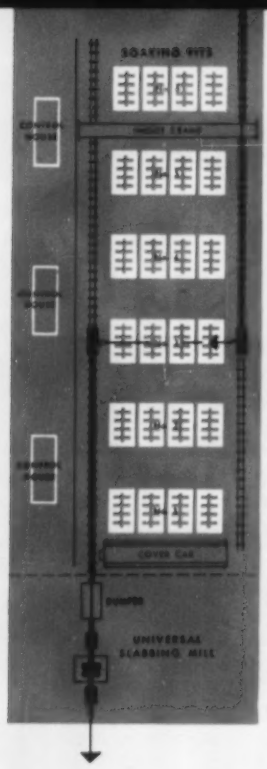
Broaching Machine Fits Into Conveyor Line



This horizontal broaching unit machines the inside diameters of laminated rotors for electric motors. It automatically positions, clamps, broaches and ejects the rotors one at a time.

A universal chute, which can be adjusted in size to accommodate several different rotors, feeds the parts to the positioning and clamping fixture. Retracting jacks in the chute hold and release the parts. Operation of the cycle is automatic. The machine continues to cycle as long as parts coming in actuate electrical interlocks. *Write:* American Broach & Machine Co., American Bldg., Ann Arbor, Mich. *Phone:* Normandy 2-5621


at Great Lakes, too...



high-production soaking pits

. . . a convincing example of 'Surface' leadership. Behind the story of these 24 soaking pits at Great Lakes Steel, Detroit Division of National Steel Corporation, is an imposing record of achievement: Surface Combustion has built 80% of all new pits since World War II.

At Great Lakes, six batteries, four 'Surface' pits in each, heat low carbon steel ingots for automotive and appliance steel. They also heat some low alloy steel ("NAX" grade).

Repeat order! Great Lakes just ordered 4 more batteries - now 40 pits in this installation.

These one-way-fired pits include such 'Surface' features as the efficient jet pump recuperative system, and integrated temperature and combustion controls which are of the most modern design. The performance of these pits, and many others, is among the reasons why steelmakers depend on 'Surface.'

SURFACE COMBUSTION CORPORATION, TOLEDO, OHIO

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STEEL MILL FURNACES

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British Furnaces, Ltd., Chesterfield; Stein & Atkinson, Ltd., London
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Benno Schilde Maschinenbau, A.G., Bad Hersfeld (Hessen, Germany)

"STUD" NELSON ATTACHES

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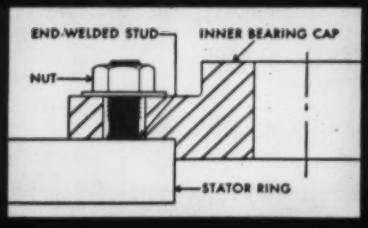
Easy does it . . . a NELWELD® gun makes the placing of attachment studs a simple operation . . . takes the tool to the work . . . cuts costly material handling . . . eliminates drilling and tapping.

Studs stay put! . . . NELSON® welded studs fuse with the parent piece to become an integral unit, equally strong at the weld.

Trigger fast, too! . . . push a button and you've got a weld.



. . . just a few reasons why the NELWELD system is the practical way to attach fixtures, brackets, bearings, accessories, pillow blocks, and endless sub-assemblies.

A corps of Nelson experts is trained to help co-engineer better fastening with inevitable cost reduction. And the Nelson network of factory warehouses blankets the country . . . puts studs, equipment, and rentals right in your own back yard! Write for details.

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Please send more information on stud welding sub-assemblies and other applications.

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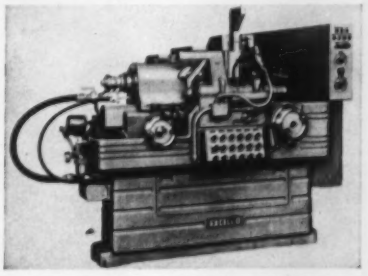
NEW PRODUCTS and equipment

Internal Thread Grinder

This machine is equipped to receive work from a conveyor, finish grind the thread automatically and eject completed parts on a moving belt for delivery to another conveyor.



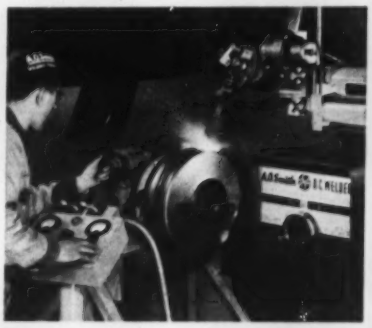
The grinding wheel is dressed as part of the automatic cycle. *Write*: Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. *Phone*: Townsend 8-3900

Welding Process Uses Carbon Dioxide Shield

The C-OMATIC process offers low-cost, automatic welding of mild and medium carbon steels.

Based on the use of standard-size cylinders, the cost of carbon dioxide is about $0.01 a cubic foot, compared with $0.06 for helium and $0.08 to $0.09 for argon (STEEL, Jan. 31, p. 68).

When large quantities of gas are used, the cost may be less, since carbon dioxide can be ob-



tained in liquid form and stored in a large container. It can be converted to gas and piped to the welding equipment for about $0.005 a cubic foot.

The new welding process features

a visible arc. There is no need for flux.

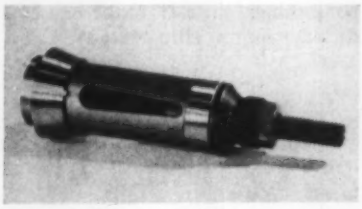
Filler wire is fed to the welding head by rollers. A motor drive gives selection of wire feed speeds. This permits application to submerged arc welding; conversion can be made by substituting a submerged arc nozzle and making a few electrical connections.

The welding nozzle consists of a contact tube, water-cooled jacket and a gas-shielding jacket. The nozzle provides a gas shield around the wire the full length of the contact tube, minimizing the tendency to draw air into the arc.

Direct-current or constant potential welding machines provide the power source. *Write*: A. O. Smith Corp., Milwaukee 1, Wis. *Phone*: Uptown 3-3000

Adjustable Stock Stops

These units can be attached to standard collets. They are readily interchangeable in regular spring collets for round and hexagonal stock and are made in two styles, spring ejector and solid.



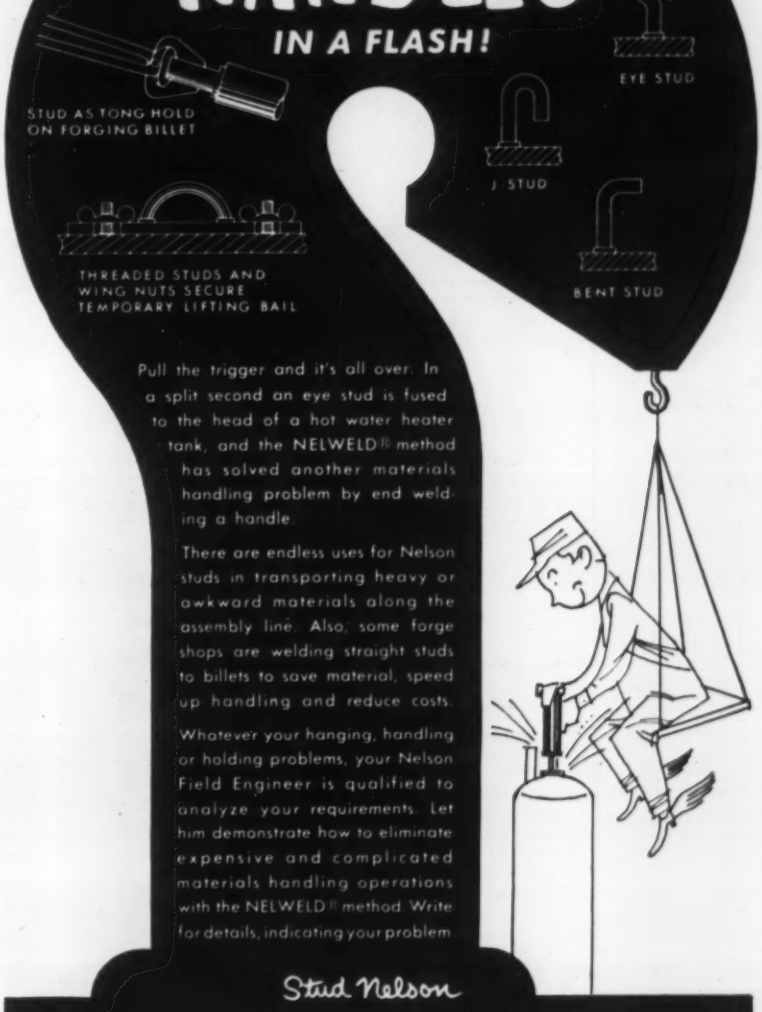
Both styles are made in three sizes for use with Nos. 10, 11 and 22 spring collets. *Write*: Dept. 43, Brown & Sharpe Mfg. Co., Providence 1, R. I. *Phone*: Dexter 1-5000

Extrusion Presses

Two new sizes, 1400 and 1700 tons, have been added to this line of hydraulic aluminum extrusion presses.

They also are available in 600, 900, 1250, 2200 and 3000-ton capacities, in die slide and gate-lock types and in long or short stroke designs. *Write*: Watson-Stillman Co., Division of H. K. Porter Company Inc., Roselle, N. J. *Phone*: Chestnut 5-5400

"STUD" NELSON END-WELDS "HANDLES" IN A FLASH!



Pull the trigger and it's all over. In a split second an eye stud is fused to the head of a hot water heater tank, and the NELWELD® method has solved another materials handling problem by end welding a handle.

There are endless uses for Nelson studs in transporting heavy or awkward materials along the assembly line. Also, some forge shops are welding straight studs to billets to save material, speed up handling and reduce costs.

Whatever your hanging, handling or holding problems, your Nelson Field Engineer is qualified to analyze your requirements. Let him demonstrate how to eliminate expensive and complicated materials handling operations with the NELWELD® method. Write for details, indicating your problem.

Stud Nelson

Fasten it Better at Less Cost with

NELWELD

NELSON STUD WELDING
2712 Toledo Avenue
Lorain, Ohio

Please send literature on how NELSON studs are used in materials handling.

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NELSON STUD WELDING DIV. OF GREGORY INDUSTRIES, INC. LORAIN, OHIO

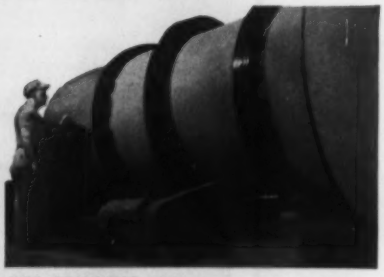
QUALITY CONTROL FOR MASS PRODUCTION. Days have been chopped to minutes by the installation of such equipment as this direct-reading spectrometer which can analyze beryllium copper alloys while they are still molten.

NEW MANUFACTURING FACILITIES INCREASE PRODUCTION, IMPROVE QUALITY OF "BERYLCO" BERYLLIUM COPPER

The production of beryllium copper, that uniquely versatile alloy which does so many jobs so well, has always been a complicated process. Beryl ore must be processed chemically to produce beryllium oxide. Master alloy is obtained by subjecting beryllium oxide, copper powder, and carbon to high temperatures in electric arc furnaces. Subsequent operations include ingot casting, soaking, annealing, pickling, hot and cold rolling, and drawing.

New technological advances—represented by a multimillion-dollar new investment in plant and equipment by The Beryllium Corporation—have successfully adapted basic quality control to large-scale production. Users of "Berylco" will reap the benefits. The spectrometer shown above, for instance, enables very close chemical control to be exercised in the production of the various beryllium copper alloys. New rolling mills produce strip to closer tolerances while enhancing over-all quality. These and other new tools produce sizes and forms not previously available —and in many cases have achieved economies which have already been passed on to users.

Write for engineering help or sample testing material.



ORE GRINDING MILL—a part of the fully integrated "Berylco" facilities.

NEW COLD-ROLLING STRIP MILL finishes beryllium copper to close tolerances.

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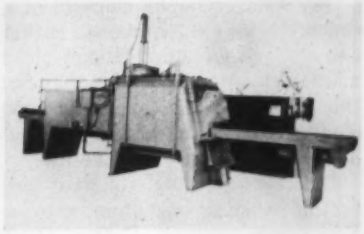
STOCKED BY WAREHOUSE DISTRIBUTORS THE COUNTRY OVER

NEW PRODUCTS and equipment

Heat Treating Units

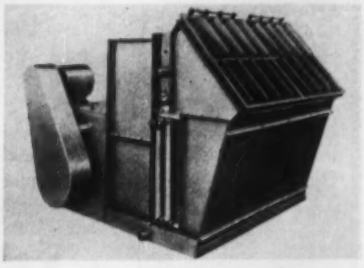
The TFC Series features multiple cooling zones for air cooling work under protective atmospheres. Work is loaded directly into the heating zone; after the proper time at heat it is transferred automatically to the cooling zones—a straight-through process.



The units are classified at 400, 500 and 900 lb an hour at 1500°F. Operating temperatures of 1850 and 2150° F are available. *Write*: Ipsen Industries Inc., Rockford, Ill. *Phone*: 5-9581

Air Conditioning Units

This line of central-station, cabinet-type units for industrial use comes in three basic types: 1. Air conditioning units. 2. Sprayed coil conditioner units. 3. Multizone conditioner units (illustrated).



Capacities range from 600 to 48,000 cu ft a minute. *Write*: American Blower Corp., Detroit 32, Mich. *Phone*: Trinity 2-4300

Mobile Welding Unit

It consists of a Lincoln 200 or 300-amp generator with a built-in exciter generator mounted on a Willys four-wheel-drive jeep or truck. Power for the welder and generator is taken off the truck engine.

The exciter generator supplies 1 or 3 kw at 115 v to furnish lights

Know more about motors...

USE THIS HANDY APPLICATION GUIDE TO SELECT

Century

Performance-Rated® MOTORS

Putting Performance-Rating to work...

...is an important step in improving the performance of driven equipment. Only if the motor fits the speed, power and operating requirements of your equipment, can you be sure of top performance and trouble-free service.

Century's unusually wide range of size, speed, frame and torque characteristics makes possible countless combinations ...one of which will be precisely right for your particular application.

Choosing a Century motor, Performance-Rated to fit your job, is a matter of minutes when you use this handy Application Guide...

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- TYPE
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- RPM RANGE
- SPEEDS — CONSTANT / MULTI-SPEED / ADJUSTABLE
- STARTING CURRENT
- STARTING TORQUE
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Please send Application Guide, Form 1700, to:

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1/8 to 400 H. P.

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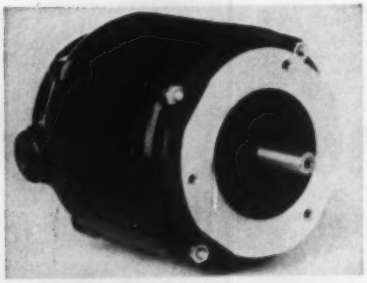
CENTURY ELECTRIC COMPANY
1806 Pine Street, St. Louis 3, Missouri
Offices and Stock Points in Principal Cities

NEW PRODUCTS and equipment

on the job or run shop tools at the same time welding is being done. *Write*: A. J. Parsons Sales & Service, Washington, Pa. *Phone*: 1795

Synchronous Motors

A new line of inductor motors, designated type SMY, is designed for uses requiring moderately high torque at low speeds, synchronous

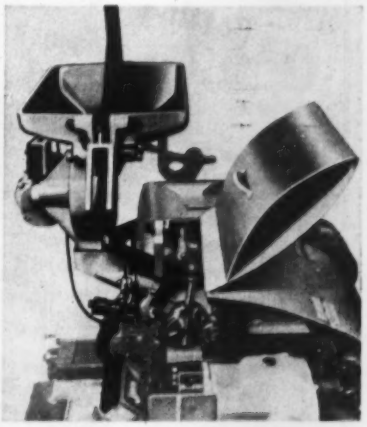


speed operation or rapid deceleration or reversing.

They are available in torque ratings of 75 and 2 oz-in. at 60, 50 and 25 cycles. *Write*: Specialty Component Motor Dept., General Electric Co., Schenectady 5, N. Y. *Phone*: Schenectady 4-2211

Hopper-Feed Mechanism

The Auto-Load automatically feeds second operation parts into a Brown & Sharpe automatic screw machine. Equipped with this device, a screw machine can feed, locate, machine and eject a variety of small pieces with the same ease as bar stock.

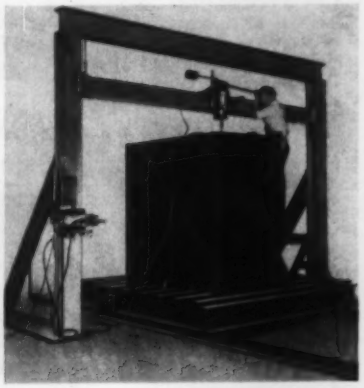


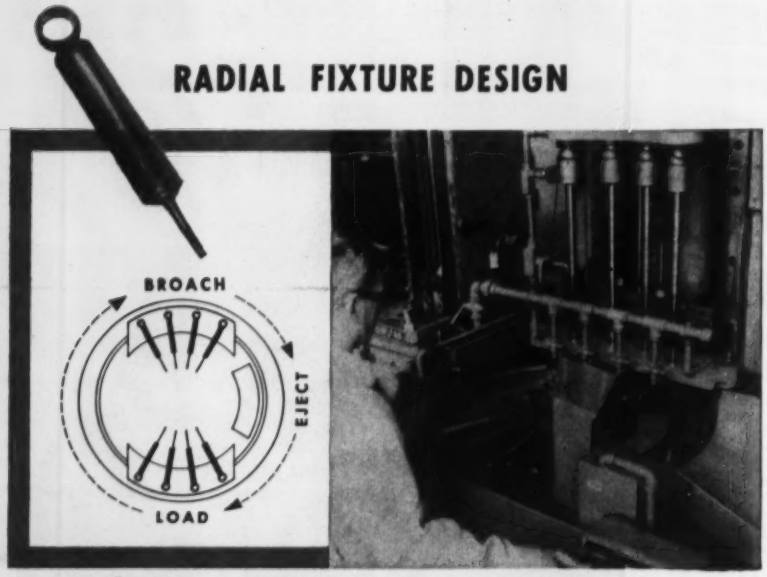
Auto-Loads are available for OG, OOG and 2G Brown & Sharpe machines. *Write*: Hi-Shear Rivet Tool Co., 8924 Bellanca Ave., Los Angeles 45, Calif. *Phone*: Oregon 8-4361

Drilling, Tapping Unit

Designed for large weldments and castings, the machine drills and taps straight rows of holes on horizontal or vertical surfaces quickly and with minimum adjustment.

Its electrically operated dolly





RADIAL FIXTURE DESIGN

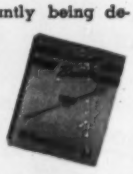
contributes to HIGH OUTPUT BROACHING the *American* way

While this American vertical pull-down broaching machine is broaching the inside diameter of four shock absorber yokes, the operator loads the opposite four radial stations of a rotating base fixture. At the end of the broaching stroke, the fixture indexes 90° and automatically ejects the parts down a chute. Fixture then rotates another 90° for loading while the second broaching cycle is begun.

Operation is push-button controlled — output over 1100 pieces per hour.

Unusual tooling to meet specialized production requirements is constantly being developed through creative engineering at American. Whether your broaching problem requires the best in automatic or automated control, or simply an economical adaptation of a standard machine, you will gain by referring your requirements to American. American has been making broaches, fixtures and broaching machines — all three — for over 35 years. To put this experience to work for you, send a blue print or sample part. An American recommendation will be furnished promptly.

Ask for Catalog No. 450.



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A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

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The sparkle that catches the car buyer's eye is a *permanent* pleasure with Superior Stainless. Time can't dull the brightwork made of this solid-bright metal. Superior Stainless Strip Steel is the dress-up feature that helps make the sale —and through superior performance, helps keep each owner sold. • Let us give you the facts on fabricating ease, gauges, tempers, finishes and coil widths for your needs.
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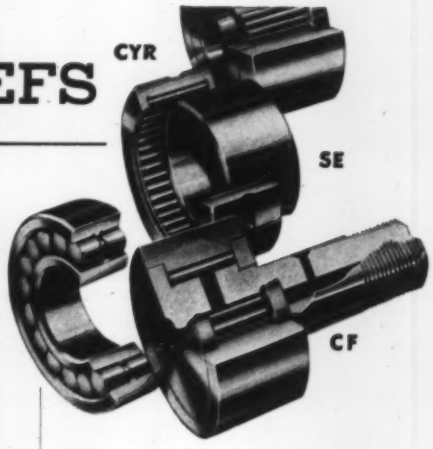
McGILL BEARING BRIEFS



Sealed GUIDEROL® bearings meet design demands of Clark *POWRWORKER* hand truck

The power head in Clark Equipment Company's Powrworker trucks required a bearing to provide radial support to the wheel-mounted pivoting drive unit. In addition it had to seal out dirt, carry a sizeable load in limited space and adapt to vertical mounting. Sealed GUIDEROL bearings meet each of these requirements.

For instance, the bearings are only 4½ inches above the floor and in contact with contaminating materials such as dirt, chemicals and brine that would freeze up ordinary unsealed bearings. Use of the Sealed GUIDEROL bearings eliminates the need for multiple parts and extra machining of the housing that would be required with auxiliary sealing of an ordinary bearing.

Although limited in size by the fit of the unit into the truck, the GUIDEROL SG Bearings take loads up to 1,500 pounds in absorbing starting and stopping inertias of the truck and the unit.

The SG Series bearings operate perfectly and last longer in vertical mounting because the center guided construction provides a guide rail that keeps the grooved rollers in alignment under any load from vertical to horizontal. They are available with built-in single and double seals with no increase in standard Guiderol bearing width.

To help insure product performance and to simplify production and assembly, investigate Sealed GUIDEROL Bearings today.

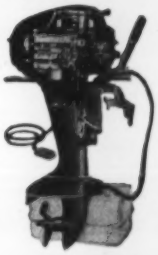
FOR YOU

Complete details on the Sealed GUIDEROL Bearing are contained in McGill Catalog No. 52. Send for a copy today.

SIKORSKY USES SEALED GUIDEROL® BEARINGS in HELICOPTER ROTORS

An obvious "must" for helicopter rotors is dependability. McGill Sealed GUIDEROL Bearings help to provide that dependability as drag hinge and flapping hinge bearings in the main and tail rotors of the Sikorsky S-55, helicopter series.

SEALED GUIDEROL® BEARINGS BRING NEW LATITUDE in DESIGN to SCOTT-ATWATER MOTORS



Used as crankshaft support in the new Scott-Atwater Bail-a-matic outboard motor line, Sealed GUIDEROL bearings give more positive seal retainment, make higher operating speeds possible, give greater capacity for future horsepower increases, and simplify assembly.

50th Anniversary

Insure performance with McGILL® . . .

MULTIROL®—GUIDEROL®—CAMROL® *full type roller bearings*

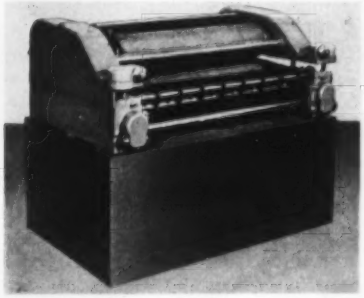
McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

has a load capacity of 10,000 lb. The unit will handle pieces up to 12 ft wide. Height is limited only by the available headroom. *Write*: L. A. B. Corp., 140 Highland Ave., Skaneateles, N. Y. *Phone*: Skan 1161

Roller Coater

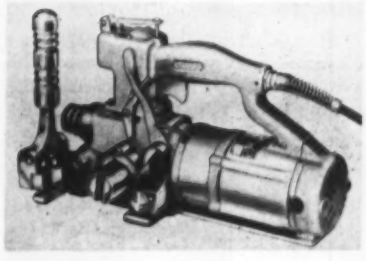
This unit coats both sides of sheet metal. Adjustments to the correct gage and coating thickness are made with vernier controls.

Rolls can be removed for cleaning without removing, restringing or resetting the mechanical drives. *Write*: Murray-Way Corp., Box 180, Birmingham, Mich. *Phone*: Jordan 4-6890



Car Banding Tools

A hand-operated tightener, types FNS and GNS, and an electric car banding tool, type ECLS (illustrated), feature built-in shears which cut the strapping close to the seal.



The automatic clutch in the electric model tightens either ¾ or 1¼-in. bands to predetermined tension and holds them until sealing is completed. Type FNS takes ¾-in. bands; type GNS, 1¼-in. *Write*: Stanley Works, New Britain, Conn. *Phone*: Baldwin 9-2021

TWO machined parts $1.00
TEN Powdermet* PARTS .... $1.00 (10¢ each)

Don't cut parts—*Cut Costs* with YALE Powdered Metal Parts

Yes, powder metallurgy has an important price story—because when you save the extensive and costly operations involved in machining, it shows up in *more parts* and lower production costs!

But at Yale & Towne, there's another story of *equal* importance ...*complete* engineering service, the kind you can trust—from consultation through production and delivery of parts that are *really* right!

Engineering service has given Yale & Towne its position of leadership in powder metallurgy. We are careful to *recommend only applications where Powdermet* parts will perform successfully.* Then, in design and production of these parts, Yale & Towne offers the experience, know-how, modern facilities and creative ingenuity that *assure* best results.

As a part of this complete engineering service, Yale & Towne maintains a continuous special training program for well-qualified engineers. These men become Powdermet* consultants—available to discuss the advantages and limitations of Powdermet* parts *right in your own plant.* They will show you how Powdermet* may cut your production costs and improve your product. And there is *no obligation* for this engineering counsel.

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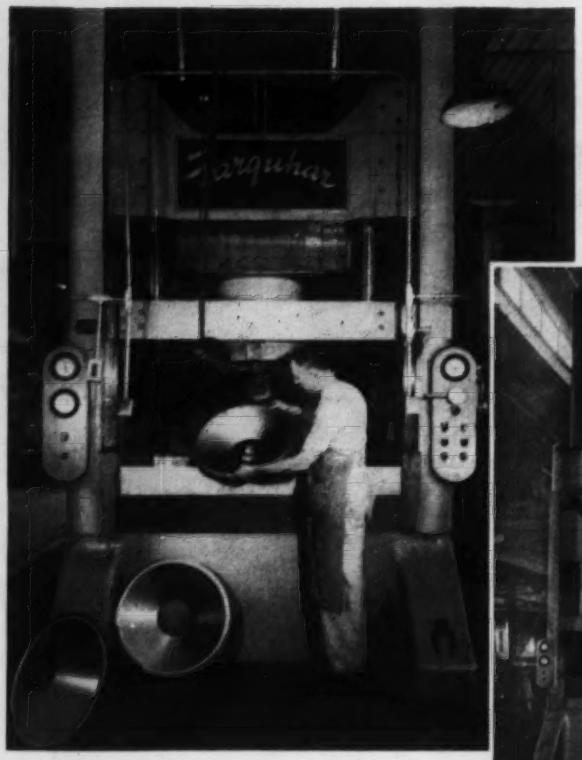
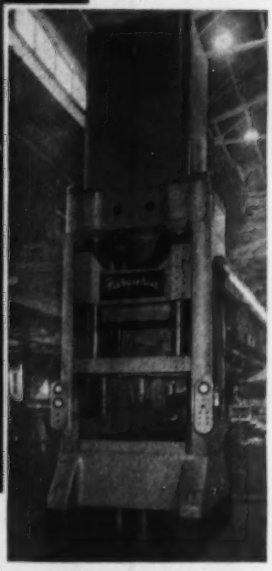


Operator removing completed ceiling diffuser ring from Farquhar Hydraulic Press at Tuttle & Bailey, Inc., New Britain, Conn.



Tuttle & Bailey reports:

FARQUHAR HYDRAULIC PRESS Makes New Product Possible

Tuttle & Bailey, Inc., New Britain, Conn., produces heating convectors, ceiling diffusers, grilles, registers, etc., as well as several defense products for the United States. When production of the ceiling diffusers was first planned, the company found they could not be manufactured with existing equipment at their plant.

Tuttle & Bailey then consulted with various hydraulic press companies, searching for a design to meet their requirements. Finally, the A. B. Farquhar Company came up with the best design—*and at the lowest cost*—a 450-ton press with pressing ram speed of 0 to 45 in./min., approach and return speed of 390 in./min., and an operating hydraulic pressure of 2650 lbs./sq. in.

The company is very pleased with Farquhar's low maintenance cost, too. The press was installed in Aug. 1950, and has required no maintenance other than occasional gasket replacement.

Farquhar Presses Cut Your Costs

The above installation is just one more example of Farquhar performance in heavy production! Farquhar Presses are built-for-the-job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of extra-long guides on the moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

For our free catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry, write to: THE OLIVER CORPORATION, A. B. FARQUHAR DIV., Hydraulic Press Dept., 1522 Duke St., York, Pa.

Farquhar

HYDRAULIC PRESSES

for Bending • Forming • Forcing • Straightening • Assembling • Drawing
Extruding • Joggling • Forging • and other Metalworking Operations

THE OLIVER CORPORATION • A. B. FARQUHAR DIVISION

NEW literature

Write directly to the company for a copy

Polyester Resins

A revised folder contains technical data on the properties of rigid, flexible and resilient-type Plaskon polyester resins—14 pages. Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

Cold-Drawing Equipment

Here is a product information bulletin on drawbenches and auxiliary equipment—8 pages. Aetna-Standard Engineering Co., Frick Bldg., Pittsburgh 30, Pa.

Welded Wire Fabric

A new design manual covers the use of this material in reinforced concrete building construction—44 pages. Dept. 50, Wire Reinforcement Institute, 1049 National Press Bldg., Washington 4, D. C.

Drill Units

The second in the ASTE Data Package Series covers specifications and performance features of drill units—24 pages. American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38, Mich.

Investment Casting

"Gas Fired Furnaces for Investment Casting" describes Surface furnaces—bulletin SC-170, 4 pages. Advertising Dept., Surface Combustion Corp., Toledo 1, O.

Electronically Guided Tractor

Described is the Guide-O-Matic tractor which moves trailer trains without an operator—bulletin 552-1, 8 pages. Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.

How To Machine Titanium

Here is a bulletin with machining recommendations for titanium and its alloys—8 pages. Mallory-Sharon Titanium Corp., Niles, O.

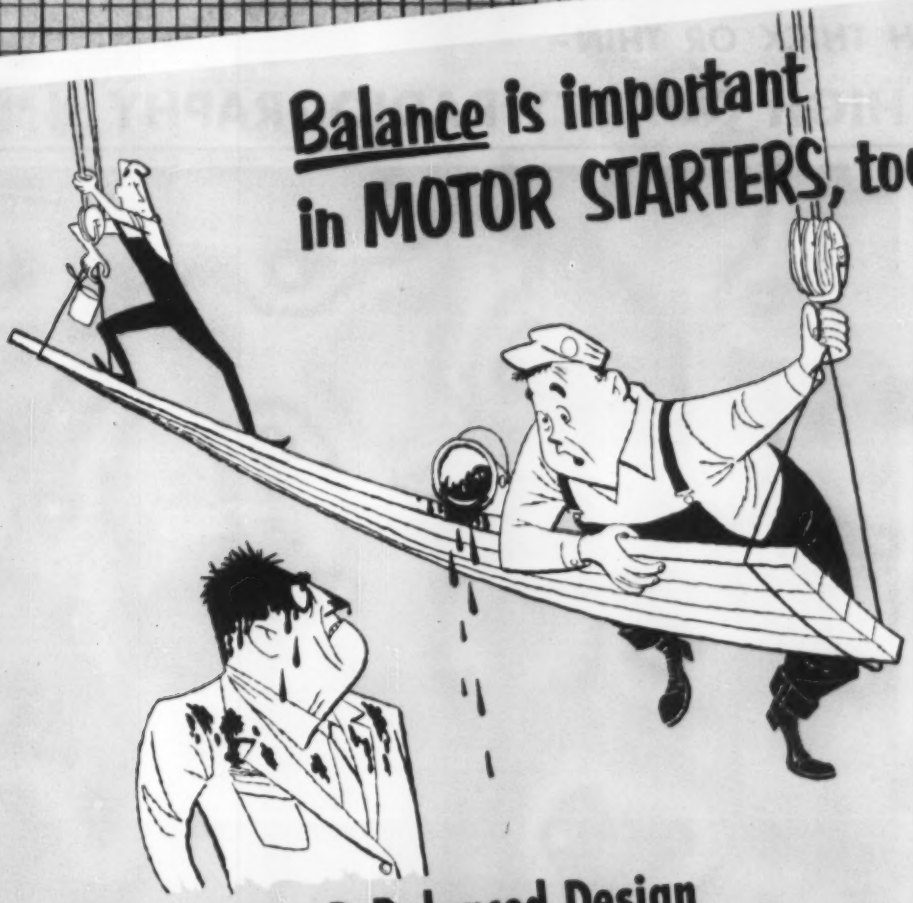
LP-Gas Trucks

"The Aircraft Story" contains case histories of two aircraft firms that converted their handling trucks to LP-Gas drives. American Liquid Gas Corp., 1109 Santa Fe Ave., Los Angeles 21, Calif.

Machinery Catalog

Over 70 types of automatic dieing machines and precision power presses are included—40 pages. Emhart Mfg. Co., 333 Homestead Ave., Hartford 2, Conn.

Balance is important in MOTOR STARTERS, too!



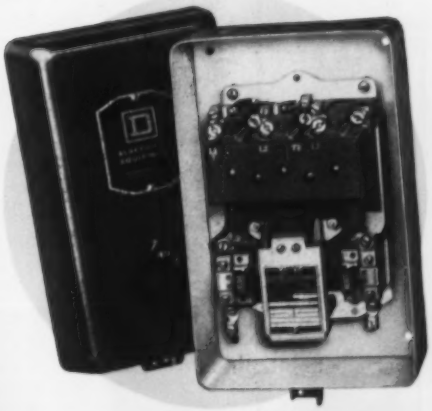
Only Square D Balanced Design Gives ALL the Features without sacrificing Any One!

EASY INSTALLATION. Plenty of wiring space with *no sacrifice of compactness.*

SIMPLE MAINTENANCE. Coils, contacts, interlocks, overload relays easily changed without disturbing external connections. Normal maintenance made still easier with standardized parts kits. No complicated identification, ordering or stocking.

FLEXIBILITY. A wide range of special requirements can be met in the field, using standard starters and parts kits available from local distributor stock.

THEY COST NO MORE . . . WHY SETTLE FOR LESS?

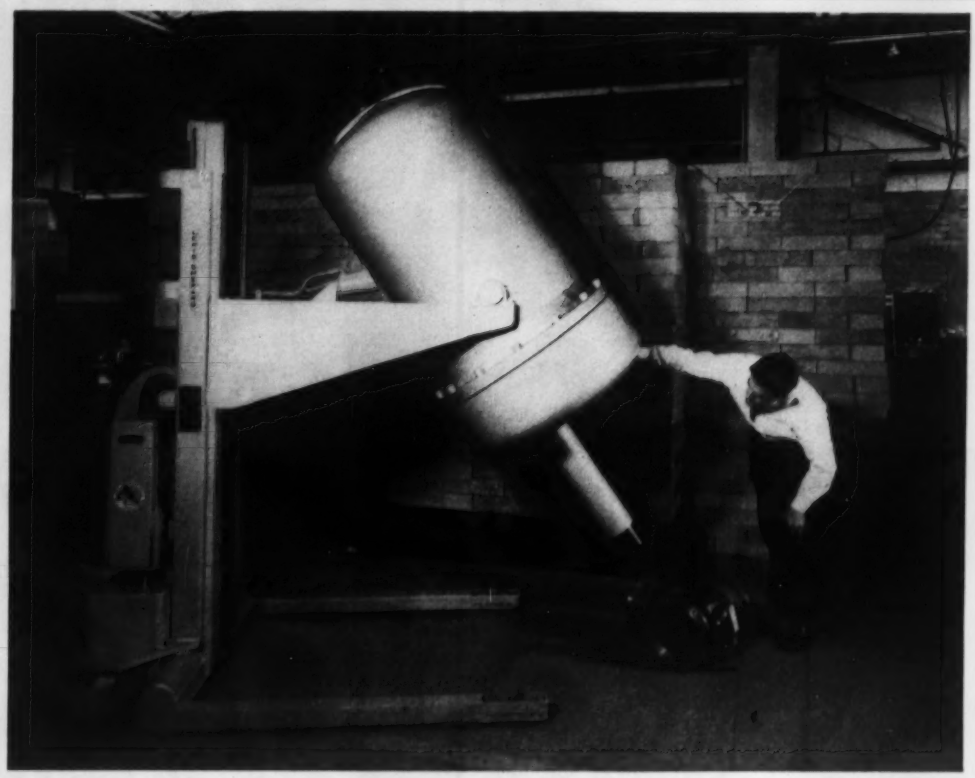


ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

THROUGH THICK OR THIN–

HIGH QUALITY RADIOGRAPHY



Whether your radiographic problem involves metal sections 5 inches thick or ⅛ inch thin, HIGH VOLTAGE's new Model JR Van de Graaff will yield radiographs of unmatched clarity on a production basis. No other industrial x-ray equipment has ever provided such versatility.

The JR is the only completely transportable source of one-million-volt x-rays available. It can be installed on a newly developed mobile motorized mount or located permanently in the smallest space at the lowest cost on any x-ray generator in its energy range.

A point source of x-rays less than 1 mm in diameter, substantial savings in set-up time, a power requirement of only 2 KVA – all these characteristics add up to low-cost, accurate radiography.

If you'd like additional information about this new Van de Graaff, write for Bulletin JR.

HIGH VOLTAGE ENGINEERING CORPORATION

7 UNIVERSITY ROAD CAMBRIDGE 38, MASSACHUSETTS

NEW LITERATURE

Technical Reprint

Copies of the article "Design Guide to Low Cost Air Supply for Industrial Dirt Blowing Systems" are offered—4 pages. U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.

Small Motor Switches

This booklet describes toggle, rotary and pushbutton switches—publication EC-79, 14 pages. Cutler-Hammer Inc., 315 N. 12th St., Milwaukee, Wis.

Drafting Practices

"Simplified Drafting" presents 11 common-sense rules for simplifying drafting practices. General Engineering Laboratory, American Machine & Foundry Co., 11 Bruce Place, Greenwich, Conn.

Portable Cords

"Anaconda Portable Cords" lists specifications and applications of Securityflex, Industrial and Service electrical cord—8 pages. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.

Wire Strain Gages

Specifications for bonded resistance gages are given. A 1955 price list for strain gages, instruments, accessories and cements also is included—12 pages. Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

Atomic Industry Products

Described are radiation shielding, reactor components, transfer and storage casks, decontamination cells and remotely controlled manipulation equipment—bulletin 274, 18 pages. Farrel-Birmingham Co. Inc., Ansonia, Conn.

Steel Machine Ways

"Coes Hardened Steel Ways" illustrates the construction, typical applications and advantages of interchangeable tool steel machine ways—4 pages. Coes Knife Co., 72 Coes St., Worcester 3, Mass.

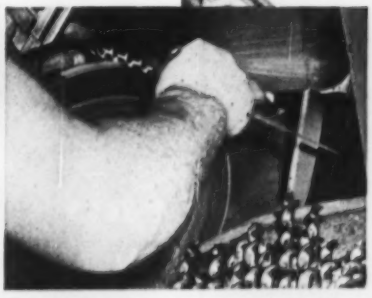
Technical Aid

"Reducing Costs with Jigs, Fixtures and Gages," is offered—No. 40. Small Business Administration, Lafayette Bldg., Washington, D. C.

Stainless Fasteners

Included are style and size data on stainless screws, bolts, nuts, washers, rivets, the "AN" type and other

1. PRODUCTION PROBLEM:
To increase production and cut unit costs of finishing crimps and grinding flutes of forged steel auger bits. Irwin Auger Bit Co. had been using grinding or hard wheels and set-up wheels in a costly three-step operation which produced only 50,000 units per week —far less than the company's requirements.



2. SOLUTION: A 3M Representative showed this Wilmington, Ohio manufacturer how the 3M Method would grind and finish forging in just one operation using a Grit 60 Electrocut Three-M-ite Cloth Belt, and produce a smoother, more even finish than was obtainable with set-up wheels.

3. RESULTS: A 50% production increase. The 3M Method boosted weekly output to over 80,000 units—cut unit costs, too. And man hours for this operation were greatly reduced. A 3M Representative can help you solve your grinding and finishing problems, too. Call him. No cost or obligation.

From the world's largest Coated Abrasives Machine

3M ABRASIVES

Made in U.S.A. by MINNESOTA MINING AND MFG. CO., St. Paul 6, Minn.—also makers of "SCOTCH" Brand Pressure-Sensitive Tapes, "SCOTCH" Brand Magnetic Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Nonslip Surfacing, "3M" Abrasives, "3M" Adhesives. Export Sales Office: 99 Park Avenue, New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

WANT MORE INFORMATION?

Minnesota Mining & Mfg. Co.
Dept. GJ-65, St. Paul 6, Minn.

☐ Send me free booklet "Grinding and Polishing Hand Tools with the 3M Method"
☐ Please have 3M Representative call

NAME..... TITLE.....

COMPANY.....

ADDRESS.....

CITY..... ZONE.... STATE.....

NEW LITERATURE

fasteners—brochure P33A, 8 pages. Allmetal Screw Products Co. Inc., 821 Stewart Ave., Garden City, L. I., N. Y.

Rotary Card Files

Here is information on how to simplify the problems of multiple record keeping with rotary files—catalog AL-2817, 20 pages. Diebold Inc., 818 Mulberry Rd. S.E., Canton 2, O.

Gang Slitters

Three types of units are discussed: 1. Conventionally driven slitters. 2. Pull-through slitters. 3. Combination slitters. Accessory equipment is described—circular 898-S-2, 24 pages. Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Balancing Machines

This catalog on the improved line of Type "S" Dynetric Balancing Machines includes new bench and vertical-type machines—bulletin 1165. Gisholt Machine Co., Madison 10, Wis.

Loading Shovel

The diesel-powered, Merton Overloader features fast, straight-line loading and variable height discharge for economical handling of bulk materials—4 pages. Seaboard Equipment Co. Inc., 7 Hanover St., New York 5, N. Y.

Carbide Tools, Blanks

A new price list covers Adamas premium grades 548 and 434. It features a guide for the selection of steel cutting grades—Price list 355P, 8 pages. Dept. D-39, Adamas Carbide Corp., Kenilworth, N. J.

Screw Machine Products

Facilities for the manufacture of custommade, precision screw machine products are described—8 pages. Beamco Inc., General Offices, Irving Park and Church Rds., Bensenville, Ill.

Automated Warehousing

The Kidde system provides the advantages of bulk picking while retaining desirable features of order picking—4 pages. Walter Kidde Constructors Inc., 140 Cedar St., New York 6, N. Y.

Tractor Shovels

Described are the Michigan model 175-A, with 2¼-cu yd capacity; and model 125-A, with 1⅝-cu yd capacity—catalog 1250-P, 12 pages. Construction Machinery Division, Clark Equipment Co., Benton Harbor, Mich.

Refractories

Physical and chemical properties of high-temperature Crystalite refractories are listed—bulletin CR-11, 12 pages. Richard C. Remmey Son Co., Hedley St. and Delaware River, Philadelphia 37, Pa.

Decimal Chart

A combination decimal equivalent chart and calendar is offered. Dayton Rogers Mfg. Co., Minneapolis 7, Minn.

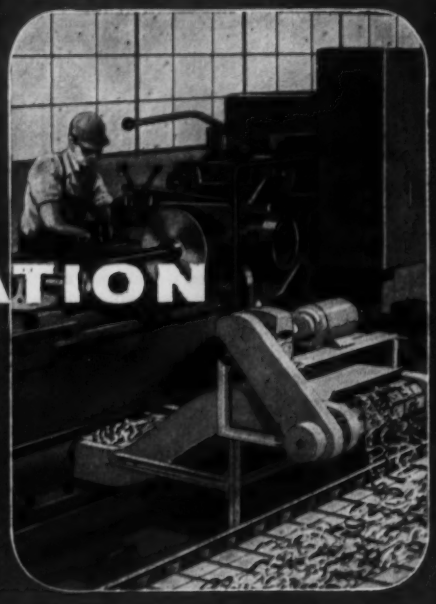
Welding Guide

"A New Welding System" presents information on the use of Murex Croloy chrome-moly electrodes—32 pages. Metal & Thermit Corp., New York, N. Y.

Investment Castings

The "Chart of Standard Investment Casting Alloys" is a ready reference guide for all concerned with selection

May-Fran
...first
for
AUTOMATION
in
scrap
handling
systems



The CHIP-TOTE conveyor permits complete utilization of machine tools by eliminating shut-down for manual scrap removal.

It handles a continuous flow of hot, wet or dry chips, turnings and borings from any multiple spindle automatic machine.

NEW LITERATURE

or specification of investment castings. Precision Metalsmiths Inc., 1081 E. 200th St., Cleveland 17, O.

Aluminum Ladders

Different types of heavy-duty ladders, made specifically for industry, are illustrated—general catalog No. 6, 44 pages. Aluminum Ladder Co., Worthington, Pa.

Spray Masks

Defined and illustrated are the major types of masks for spray-decorating plastics, diecastings and metal stampings—20 pages. Wm. M. Fiore Inc., 135 Liberty St., New York 6, N. Y.

Preventive Maintenance

Here is a case history on chemical cleaning methods that reduced shutdowns in an industrial power house—2 pages. Dowell Inc., Tulsa 1, Okla.

Pneumatic Standards

Copies of revised "J.I.C. Pneumatic Standards for Industrial Equipment" are offered—12 pages. Miller Fluid Power Co., 2040 N. Hawthorne Ave., Melrose Park, Ill.

Transformers, Rheostats

Dry-type transformers, with NEMA Group 3 insulation and liquid rheostats employing a complete NEMA 1 enclosure, are described — bulletins 61B8222 and 14B8231. Allis-Chalmers Mfg. Co., 1021 S. 70th St., Milwaukee, Wis.

Electric Switches

Included in this catalog of drum controllers, foot and limit switches are engineering and application data, plus connection diagrams and dimensions—catalog 5509, 48 pages. Furnas Electric Co., 1055 McKee St., Batavia, Ill.

Centrifugal Pumps

Information is given on centrifugal pumps for acids, alkalies and slurries —bulletin W-350-B14B, 20 pages. Advertising & Sales Promotion Dept., Worthington Corp., Harrison, N. J.

Spectrograph

Operating details and specifications of the new three-meter, concave grating spectrograph are given—bulletin 52, 4 pages. Baird Associates Inc., 33 University Rd., Cambridge, Mass.

Slip Roll Formers

Specifications on a complete line of power and hand-operated machines are given—bulletin 77 D, 18 pages. Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.

Die Springs

Choose the correct size and capacity springs for your operation from this catalog—16 pages. Danly Machine Specialties Inc., 2100 S. Laramie Ave., Chicago 50, Ill.

Press Rebuilding

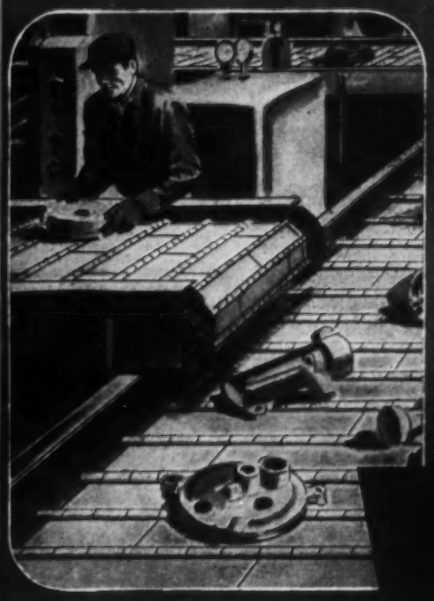
"Revitalizing Older Presses through Press Rebuilding" describes rebuilding facilities and techniques developed by Bliss—bulletin 47, 8 pages. E. W. Bliss Co., Canton, O.

Gas Welding Torches

Data and specifications on five new oxyacetylene torch sets are given in separate brochures. Marquette Mfg. Co., 307 E. Hennepin Ave., Minneapolis, Minn.

Machinery Replacement Aid

Offered is a slide chart to simplify calculation of the challenger's adverse minimum in the MAPI method. Sundstrand Machine Tool Co., Rockford, Ill.



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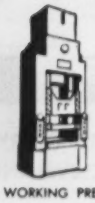
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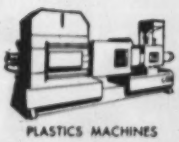
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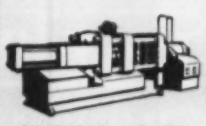
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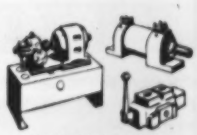
POWER EQUIPMENT

Market Outlook

IF OPTIMISM has anything to do with it, the steel business will be good the rest of the year.

Almost everyone seems to be optimistic. That includes Secretary Sinclair Weeks of the U. S. Department of Commerce. He doesn't see much evidence of a slackening in the latter part of the year.

Westinghouse Electric Corp., Pittsburgh, expects to buy as much steel in the third quarter as it bought in the second.

A SPUR—Many other steel buyers are as hopeful. This is spurring them to keep as far ahead on steel company order books as they can, just to make sure they'll have steel if they need it.

While mills like to see business roll in, they are keeping a close rein on order books. The mills don't want to fall farther behind in delivery of the products that are in heavy demand. Also, the mills are keeping a close watch on steel consumers' inventories. A substantial build-up in inventories would be a warning that some of the orders on the books would wash out.

STILL STRONG—Cutbacks in steel orders by the automobile industry have been light, even though projections for auto output in the third quarter are 20 per cent under those of the second, and changing over of models will reduce cousumption temporarily. However, some buyers have asked that steel shipments be deferred. Producers of cold-rolled carbon sheets welcome these deferrals, for they reduce mill arrearages.

Steel consumption should drop off a little because of plant closings for summer vacations.

NEW RECORD—Helping add to the business optimism is the high rate of steel ingot production. Output in the week ended June 12 set a record of 2,352,946 net tons of steel for ingots and castings. Previous record was 2,340,880 tons made in the week ended May 29.

In setting the new record, ingot output was at 97.5 per cent of capacity. The preceding week's rate was 96.5 per cent. In the previous record week (the week ended May 29), operations were at 97 per cent.

NEAR THE TOP—Even though business optimism is high, steel production is not likely to go much higher. Without the stimulus of a war, steel producers are not inclined to push ingot facilities much harder. Some mills are above 100 per cent of capacity ratings now.

GOOD FOR ALL—Heavy demand for steel is no longer centered at the mills. Warehouses are sharing in it, too. June is showing up as well as May, the best month this year. In some cases, steel is going out of warehouses faster than it is coming in from mills. Warehouse prices are steady and will remain so until after steel wage adjustments have been made.

SCRAP RISES—Steel scrap prices, regarded by many as a good barometer of the steel business, rose for the first time since the week ended Mar. 23. In the week ended June 8, STEEL's price composite of steelmaking scrap was $35 a gross ton, compared with $34.67 in the preceding week. The scrap price rise was not universal. In some geographical areas and on some grades there were declines.

STEEL's price composite on finished steel remains at $118.45 a net ton.

NATIONAL STEELWORKS OPERATIONS

DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended June 12	Change	Same Week 1954	Same Week 1953
Pittsburgh	98	+ 1*	70	97.5
Chicago	98	— 1.5*	85	105
Mid-Atlantic	95.5	— 1	57	98
Youngstown	98	+ 2	69	105
Wheeling	94.5	+ 1.5	88.5	100
Cleveland	102	+ 1	70.5	98.5
Buffalo	104.5	0	67.5	106.5
Birmingham	93.5	— 2.5	78.5	101
New England	90	0	52	95
Cincinnati	91	+ 6	69.5	95
St. Louis	95.5	+ 3.5	72.5	82.5
Detroit	93	— 1	76.5	110
Western	107	+ 3	85	111
National Rate	97.5	+ 1	73	99.5

INGOT PRODUCTION‡

	Week Ended June 12	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	145.3†	143.9	146.0	108.7
NET TONS (In thousands)	2,334†	2,312	2,345	1,746

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 59

Technical Outlook—p. 107

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	June 7 1955	May 31 1955	Month Ago	May Average
(1947-1949=100)	144.8	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 7

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525
Rails, Light, 40 lb	5.917
Tie Plates	5.275
Axles, Railway	7.500
Wheels, Freight Car, 33 in. (per wheel)	48.500
Plates, Carbon	4.675
Structural Shapes	4.517
Bars, Tool Steel, Carbon (lb)	0.430
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., Alloy	8.875
Bars, H.R., Stainless, 303 (lb)	0.423
Bars, H.R., Carbon	5.000
Bars, Reinforcing	4.963
Bars, C.F., Carbon	8.160
Bars, C.F., Alloy	11.375
Bars, C.F., Stainless, 302 (lb)	0.438
Sheets, H.R., Carbon	4.870
Sheets, C.R., Carbon	5.884
Sheets, Galvanized	7.220
Sheets, C.R., Stainless, 302 (lb)	0.553
Sheets, Electrical	$9.350
Strip, C.R., Carbon	7.493
Strip, C.R., Stainless, 430 (lb)	0.415
Strip, H.R., Carbon	5.075
Pipe, Black, Buttweld (100 ft)	15.000
Pipe, Galv., Buttweld (100 ft)	18.605
Pipe, Line (100 ft)	146.804
Casing, Oil Well, Carbon (100 ft)	154.216
Casing, Oil Well, Alloy (100 ft)	227.875
Tubes, Boiler (100 ft)	‡
Tubing, Mechanical, Carbon	‡
Tubing, Mechanical, Stainless, 304 (100 ft)	167.023
Tin Plate, Hot-dipped, 1.25 lb	8.533
Tin Plate, Electrolytic, 0.25 lb	7.233
Black Plate, Canmaking Quality	6.333
Wire, Drawn, Carbon	8.075
Wire, Drawn, Stainless, 430 (lb)	0.545
Bale Ties (bundle)	5.860
Nails, Wire, 8d Common	7.815
Wire, Barbed (80-rod spool)	7.139
Woven Wire Fence (20-rod roll)	16.925

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	June 8 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.75	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.20	$94.32
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	35.00	34.67	34.83	28.17	40.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 8 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Paltes, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINSHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, $\frac{7}{32}$-$\frac{1}{2}$" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$34.50	$34.50	$34.50	$29.50	$46.00
No. 1 Heavy Melt, E. Pa.	36.50	35.50	36.00	23.00	32.50
No. 1 Heavy Melt, Chicago	34.00	34.00	34.00	32.00	40.00
No. 1 Heavy Melt, Valley	34.50	34.50	34.50	29.50	44.75
No. 1 Heavy Melt, Cleve.	31.50	31.50	31.50	28.50	42.75
No. 1 Heavy Melt, Buffalo	29.50	29.50	30.50	26.50	42.00
Rails, Rerolling, Chicago	51.50	51.50	52.50	44.50	52.50
No. 1 Cast, Chicago	40.50	40.50	40.50	38.50	48.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price June 8	Last Change	Previous Price	May Avg.	Apr. Avg.	June 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.906
Zinc	12.00	Apr. 6, 1955	11.50	12.000	11.927	10.923
Tin	92.25	June 8, 1955	91.50	91.410	91.458	94.178
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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Nonferrous Metals

It's nearly time for the summer doldrums, but nonferrous metals men face it without trepidation. They see demand for their products exceeding supply

Nonferrous Metals Prices, Pages 174 & 175

AS THE TIME for the summer doldrums approaches, nonferrous metals men express extreme confidence in the economy of the nation and especially of their own business.

Last week's strike threat in the automotive industry was brushed off with little more than casual interest. Most of the metals are in such a strong position that a short strike wouldn't have hurt them much. As the second half approaches, most officials can see only more business than they can handle.

Running Ahead — Aluminum demand is still running far ahead of supply as it looks like the government is going to lend another helping hand. The primary aluminum products industry advisory committee of the Business & Defense Services Administration recommended that government hold back its call for stockpile aluminum in the third quarter, that exports be cut back to 1 million lb a month and that shipments for government account due by Aug. 31 be extended until Oct. 31. These requests are in line with those made before the House Small Business Subcommittee last month.

But it looks like some kind of government control is in the offing for further distribution of government-aid aluminum. Congressman Sidney R. Yates (Dem., Ill.), chairman of the subcommittee, requested detailed information from the producers as to how the extra metal would be distributed and to whom. He claims that not enough thought has been given to the "serious plight of the many small businesses in the aluminum industry. . ."

Need for Rest—Copper would welcome some kind of respite from the scarcity problem, but it doesn't appear to be in the books. There is no more copper in Defense Production Act inventory, so about the only aid the industry can get from that source is deferral of metal from stockpile delivery. And the industry already is far in debt to the government for past deferrals. Much more aid of that nature will put producers right behind the eight ball when it comes time to repay the metal. Bache & Co., among others, sees no letup in the situation for the rest of this year, especially if there is labor trouble in the industry.

Officials of International Union of Mine, Mill & Smelter Workers say that since negotiation began in early May, none of the copper companies has come up with a serious offer. Expiration date of the present contract is June 30. With business so strong, supply so short and copper price so high, it's a good bet some agreement will be reached before a strike develops.

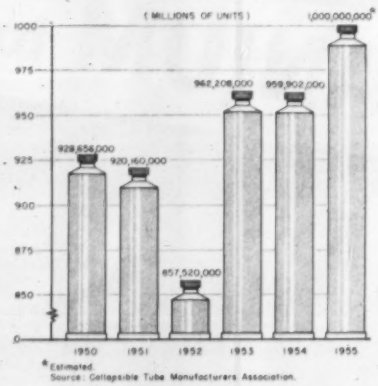
Same Tune—Zinc carries out the theme of good business as is evidenced by the May statistics issued by American Zinc Institute. As compared with April, production in May increased a little over 2000 tons while total deliveries decreased about 2500 tons. Yet stocks at the end of the month were 63,184 tons, down from the previous month's figure of 74,579. The government account took over 10,000 tons, up from April, but still below the tonnage for every other month since July, 1954. Unfilled orders continued to rise. Stocks of special high-grade zinc increased, but they are still only 7519 tons. Stocks of all other grades decreased during the month.

Lead also is in a strong position, with orders holding at fairly high levels, resulting in continuing decrease in stocks. Battery shipments fell off 40,000 units in April, but demand for the rest of the year is expected to remain high.

Solid as a Rock—In primary metals, the price picture generally looks pretty stable. Copper, despite its abnormally high price tag, will not come down as long as the even-higher European price continues to draw off foreign metal that would otherwise come to this country. Lead and zinc will not come down because of the government's support. And aluminum is enjoying too much prosperity to move either way unless it has to after contracts come up for negotiation late this summer.

Collapsible Metal Tubes

Squeezing Out a New Record



Shipments Far from Collapsing

Collapsible metal tubes appear headed for a new record (see chart) as five of the six product classifications listed by the Collapsible Tube Manufacturers Council showed gains for the first four months of 1955. Total shipments were 337,369,320 units during that period, compared with 325,910,160 units in the corresponding period last year.

Lead is still the most-used metal, with 5,310,931 lb in the four-month period. Aluminum is gaining, mostly at the expense of tin, with 2,380,836 lb.

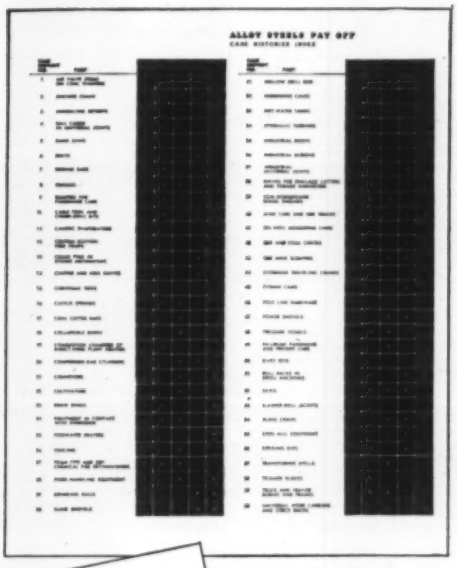
Tin has slipped off to only 445,473 lb. Dentifrice tubes continue to be the largest category, accounting for 48.41 per cent of all tubes manufactured so far this year.

Everybody Made Money

It appears now that Miami Copper, Howe-Sound and Copper Range aren't the only ones making money out of copper transactions with the government. The government itself is doing all right. But the amount of profit the three producers will realize will not be known until March, 1956, when they have to repay the stockpile for the diverted metal. If the market price goes up, they could lose money on the deal. If the price goes down, they will make a profit. Much the same could be said for the government, but, generally, stockpile metal will bring a higher price on the market than the producers got for it.

Market Memo

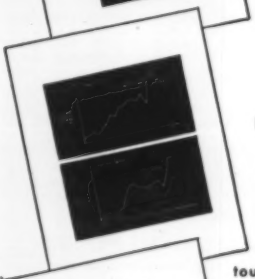
- U. S. industries used 11 per cent more tin in the first quarter of this year than in the corresponding period of last year.



60 fully documented case histories

Facts on maximum pay load

Facts on lower operating costs



Facts on lower corrosion rate

Facts on toughness, wear, strength

CLIMAX MOLYBDENUM COMPANY, Dept. 3
500 Fifth Avenue, New York 36, N. Y.

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"Alloy Steels Pay Off"

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If you use steels, here's the handbook you should have

This fact-packed handbook is a must for you if you use steel. Here, in completely documented form, you'll find how the use of alloy steels adds economies, increases service life, offers many other advantages.* Cost-conscious executives will find the full story on these economies of alloy steel in the first section of the handbook. Designers and metallurgists will find the advantages of alloy steels in the 60 case histories. Get your copy today. Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.

M55-18

***Advantages of ALLOY STEELS**

- longer life
- greater pay load
- lower operating costs
- greater safety
- less maintenance

CLIMAX MOLYBDENUM

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$100 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99%+, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $295-$298 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $18-$20 per troy oz.

Platinum: $76-$79 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 90.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 92.25; prompt, 92.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 26.25-27.50; No. 12 foundry alloy (No. 2 grade), 25.50; 5% silicon alloy, 0.60 Cu max, 27.25-28.00; 13 alloy, 0.60 Cu max, 27.25-28.00; 195 alloy, 27.50-28.00; 108 alloy, 26.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 26.50-27.25; grade 2, 25.50-26.25; grade 3, 24.50-25.25; grade 4, 24.00-24.75.

Brass Ingot: Red brass No. 115, 34.50; tin bronze No. 225, 45.00; No. 245, 39.75; high-leaded tin bronze No. 305, 38.00; No. 1 yellow, No. 405, 29.25; manganese bronze No. 421, 31.75.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	53.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.50-16.50; old sheets, 11.00-13.50; borings and turnings, 7.50-8.50; crankcases, 11.00-13.50; industrial castings, 11.00-13.50.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	...	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Muntz Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 31.00-32.50; No. 2 copper, 30.00-31.00 light copper, 28.00-29.00; No. 1 composition red brass, 24.50-25.00; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 15.00; new brass clippings, 21.50-22.00; No. 1 brass rod turnings, 19.50-20.00; light brass, 15.50-16.50; heavy yellow brass, 16.50-18.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 18.00-19.00; cocks and faucets, 19.50-20.50; brass pipe, 19.50-20.50.
Lead: Heavy, 11.50-11.75; battery plate, 6.00-6.75; linotype and stereotype, 13.50-14.25; electrotype, 12.00-12.50; mixed babbitt, 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.
Monel: Clippings, 36.00-37.00; old sheets, 32.00-33.00; turnings, 27.50; rods, 36.00-37.00.
Nickel: Sheets and clips, 70.00-80.00; rolled anodes, 70.00-80.00; turnings, 55.00-65.00; rod ends, 70.00-80.00.
Tin: No. 1 pewter 50.00-59.00; block tin pipe 75.00-77.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.50-5.00; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Aluminum: 1100 clippings, 18.00-19.00; 3003 clippings, 18.00-19.00; 6151 clippings, 17.50-18.50; 5052 clippings, 17.50-18.50; 2014 clippings, 17.00-18.00; 2017 clippings, 17.00-18.00; 2024 clippings, 17.00-18.00; mixed clippings, 17.00-18.50; old sheet, 14.50-15.50; old cast, 15.00-16.00; clean old cable (free of steel), 17.50-18.50; borings and turnings, 15.00-17.50.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper and Brass: No. 1 copper, 35.50; No. 2 copper, 33.50-34.00; light copper, 31.75-33.25; refinery brass (60% copper) per dry copper content, 31.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
Copper and Brass: No. 1 copper, 34.50; No. 2 copper, 32.50; light copper, 30.75; No. 1 composition borings, 26.50-27.50; No. 1 composition solids, 27.00-27.50; heavy yellow brass solids, 19.50-20.00; yellow brass turnings, 18.50-19.00; radiators, 20.00-20.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.105; 200-499 lb, $1.09; 500-999 lb, $1.085; 1000 lb or more, $1.08.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

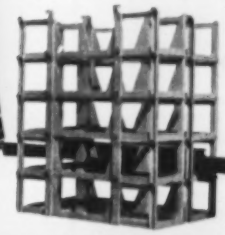
Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 70.60; 100-500 lb, 56.30; 700-1900 lb, 53.90; 2000-9900 lb, 52.10; 10,000 lb or more, 51.00.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.564; 50 lb, $1.224; 100-300 lb, $1.074, 400-900 lb, $1.049; 1000-1900 lb, $1.025; 2000-4900 lb, 98.80; 5000-19,900 lb, 92.70; 20,000 lb or more, 86.60.
Stannous Sulphate: Less than 50 lb, $1.264; 50 lb, 96.40; 100-1900 lb, 94.40; 2000 lb or more, 92.40.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

CONSULT FOR THE BEST

P-S PORTABLE *Heavy Duty* BAR RACKS

ANY RACK EASILY ACCESSIBLE

Tier and store steel shapes the simple, safe, space-saving way. No rack selection problem using overhead crane. Design-adapted for easy selection from racks without disturbing tiers. Custom-built for any capacity and stock length.

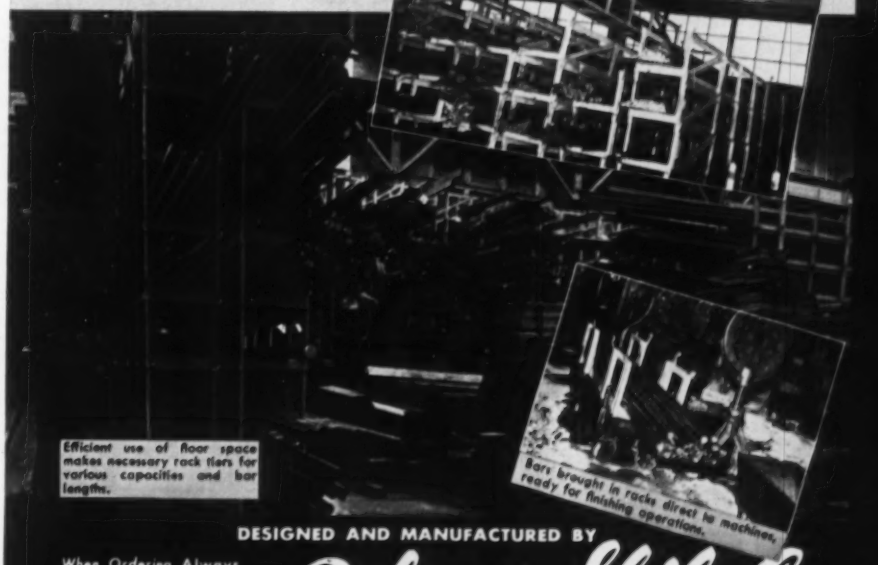


Item C-497

Any rack easily accessible by one-man operated overhead crane with automatic double tong for quick pick-up and easy carrying.

Sturdy, all-purpose bar racks in tiers save man-hours, make for maximum storage efficiency.

Thousands of different size bars may be stored in tiers to save valuable floor space.



Efficient use of floor space makes necessary rack tiers for various capacities and bar lengths.

Bars brought in racks direct to machines, ready for finishing operations.

When Ordering Always give "item" number; this will help prevent error.

Write for catalog

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16025 FULLERTON AVE., DETROIT 27, MICH.

550 Fifth Ave., New York 36, N. Y. Plaza 7-8774 • 612 N. Michigan Ave., Chicago 11, Ill. Michigan 2-7407
857 Leader Bldg., Cleveland 14, Ohio. Superior 1-3235 • 835 N. Capital Ave., Indianapolis, Ind. Melrose 5-2587
1209 Burlingame, Burlingame, Calif. Diamond 2-0823 • 6440 Fleet St., Los Angeles, Calif. Raymond 3-3733

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 177. Key to footnotes, page 179.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$65.00
Houston S5 .....70.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 .....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2 ..64.00
LoneStar,Tex. L6 ....70.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 .....$78.00
Bessemer,Pa. U5 .....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....83.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Midland,Pa. C18 .....78.00
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 .....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
LoneStar,Tex. L6 .....4.30
Munhall,Pa. U5 .....3.90
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.45
Houston S5 .....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....4.925
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 ....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7....4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.30
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 .....5.00
Phoenixville,Pa. 4.20
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.25
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.45
Ind.Harbor,Ind. I-2, Y1..6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ...5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 .....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....4.225
Houston S5 .....4.275
Ind.Harbor,Ind. I-2, Y1..4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Coatesville,Pa. L7 .....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.50
Ind.Harbor,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14..6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14..5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 .....5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.275
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Bridgeport,Conn. N19 ..4.55
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
Joliet,Ill. P22 .....4.30
KansasCity,Mo. S5 .....4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Midland,Pa. C18 .....4.30
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ...5.05
So.Chicago R2,U5,W14 ..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 .....5.075
Canton,O. R2, T7.....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.175
Fontana,Calif. K1 .....6.125
FairlessHills,Pa. U5 ...5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1..5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2,U5,W14..5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.R. Leaded Alloy

Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.55
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.70
Ind.Harb.,Ind. I-2, Y1 ..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.45
KansasCity,Mo. S5 ....5.45
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12,R2.5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 .....5.65
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ....5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19.4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2,M13.6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ...6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 .....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ....6.925
Youngstown F3, Y1....6.625

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 .....7.70
Carnegie,Pa. C12 .....7.525
Chicago W18 .....7.525
Cleveland C20 .....7.525
Monaca,Pa. S17 .....7.525
Newark,N.J. W18 .....7.70
SpringCity,Pa. K3 .....7.70
Warren,O. C17 .....7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.55

Ind.Harbor, Ind. 1-2, Y1 4.30
Johnstown,Pa. B2 ....4.30
Joliet,Ill. P22 ....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 ....5.00
Milton,Pa. M18 ....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 ....5.00
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
SandSprings,Okla. S5 ...4.80
Seattle B3, N14, P23 ...5.05
So.Chicago R2 ....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ....4.40
Struthers,O. Y1 ....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..5.70
KansasCity,Kans. S5 ...6.50
LosAngeles B3 ....5.95
Marion,O. P11 ....5.55
Pittsburgh J5, U8 ....5.72
Seattle B3, N14, P23 ...6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ½-1" B2 ..5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa. (3) J8 ....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ...4.75
Franklin,Pa.(3) F5 ....4.20
Franklin,Pa.(4) F5 ....4.30
Marion,O.(3) P11 ....4.20
Moline,Ill.(3) R2 ....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ....10.85
McK.Rks.(D.R.)L5.... 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 ....4.05
Allenport,Pa. P7 ....4.05
Ashland,Ky.(8) A10 ...4.05
Cleveland J5, R2 ....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 ....4.15
Dravosburg,Pa. U5 ....4.05
Ecorse,Mich. G5 ....4.15
Fairfield,Ala. T2 ....4.05
FairlessHills,Pa. U5 ...4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 ....4.05
Geneva,Utah C11 ....4.15
GraniteCity,Ill. G4 ....4.25
Ind.Harbor,Ind. I-2, Y1.4.05
Kokomo,Ind.C16 ....4.15
Lackawanna,N.Y. B2 ...4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 ....4.05
Newport,Ky N9 ....4.05
Niles,O. N12 ....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 ....4.05
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 ....4.05
Sharon,Pa. S3 ....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 ....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 ....5.35
Kokomo,Ind. C16 ....5.20
Niles,O. N12 ....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....5.80
Youngstown Y1 ....5.80

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....6.10
Conshohocken,Pa. A3 ...6.15
Dravosburg,Pa. U5 ....6.10
Ecorse,Mich. G5 ....6.20
Fairfield,Ala. T2 ....6.10
FairlessHills,Pa. U5 ...6.15
Fontana, Calif. K1 ....6.875
Gary,Ind. U5 ....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 ....6.10
Pittsburgh J5 ....6.10
Sharon,Pa. S3 ....6.10
So.Chicago,Ill. U5 ....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 ....6.10
Weirton, W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 ....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 ....4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ....4.95
Cleveland J5, R2 ....4.95
Conshohocken,Pa. A3 ...5.00
Dravosburg,Pa. U5 ....4.95
Ecorse,Mich. G5 ....5.05
Fairfield,Ala. T2 ....4.95
FairlessHills,Pa. U5 ...5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 ....6.05
Gary,Ind. U5 ....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Lackawanna,N.Y. B2 ...4.95
Middletown,O. A10 ....4.95
Newport,Ky. N9 ....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 ....4.95
Portsmouth,O. P12 ....4.95
SparrowsPoint,Md. B2 ..4.95
Warren,O. R2 ....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 ....4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ....7.50
Dravosburg,Pa. U5 ....7.50
Ecorse,Mich. G5 ....7.60
FairlessHills,Pa. U5 ...7.55
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 ....7.50
IndianaHarbor,Ind. Y1 ..7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 ....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 ....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 ....7.50

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.45

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Dravosburg U5	5.70	....
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Kokomo,Ind. C16	5.80	....
MartinsFry. W10	5.70	....
Newport,Ky. N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky A10 ....6.75
Gary,Ind. U5 ....5.95
MartinsFerry,O. W10 ...5.95

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 ....5.45‡
Ashland,Ky. A10 ....5.45*
Butler,Pa. A10 ....5.45†
Canton,O. R2 ....5.45‡
Delphos,O. N16 ....6.10‡
Dover,O. R1 ....5.45‡
Dravosburg,Pa. U5 ...5.45†
Fairfield,Ala. T2 ....5.45†
Gary,Ind. U5 ....5.45*
GraniteCity,Ill. G4 ...5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Kokomo,Ind. C16 ....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 ....5.45‡
Niles,O. N12 ....5.45‡
Pittsburg,Calif. C11 ...6.20*
SparrowsPt.,Md. B2 ...5.45‡
Warren,O. R2 ....5.45†
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.325

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.20
SparrowsPoint(30) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 ....5.85
Dravosburg,Pa. U5 ....5.85
Kokomo,Ind. C16 ....6.20
Newport,Ky. N9 ....5.85
Niles,O. N12 ....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 ....5.70
Butler,Pa. A10 ....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 ....6.30
Niles,O.(28) R2 ....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 ....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8)A10 ...5.375
Cleveland R2 ....5.375
Dravosburg,Pa. U5 ...5.375
Gary,Ind. U5 ....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Middletown,O. A10 ....5.375
Niles,O. N12 ....5.375
Youngstown Y1 ....5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 ....6.60
Yorkville,O. W10 ....7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 ....5.85
Mansfield,O. E6 ....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 ....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod.Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn. N19	4.35
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.00
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Ind.Harbor,Ind. Y1	6.70
LosAngeles B3	7.90
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.40
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.50
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	12.45
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	...
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	...	...
Detroit D2	5.85	8.25	9.20	10.95	...
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	...
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	...
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	...
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	12.90	15.60	...
Buffalo W12	...	12.90	...	...
FranklinPark,Ill. T6	...	13.40	16.10	19.50
Harrison,N.J. C18	...	12.90	15.60	19.00
New York W3	...	12.90	15.60	19.00
Trenton,N.J. R5	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	12.90	15.60	19.00
Worcester,Mass. W12	...	12.90	...	...
Youngstown C8	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	11.00
Vandergrift,Pa. U5	....	8.50	9.10	10.10	....
Warren,O. R2	....	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½¢ lower)

	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	...
Butler,Pa. A10	....	....	16.60	17.10	...
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed semiprocessed ½¢ lower. §Coils, ¾-cent higher.

Lackawanna,N.Y. B2 ..8.425
Pittsburgh J5 .....8.60
Sharon,Pa. S3 .....8.60
SparrowsPoint,Md. B2..8.425
Warren,O. R2 .....8.60
Weirton,W.Va. W6 .....8.60
Youngstown Y1 .....8.60

STRIP, Electrogalvanized

Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.85*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gary,Ind. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No. Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.30
Chicago W13	11.30
Cleveland A7	11.30
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.30
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.30
Kokomo,Ind. C16	11.30
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.30
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.85
Waukegan,Ill. A7	11.30
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd AC&R for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.30
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.65
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton, Ill. L1	13.25
Bartonville, Ill. K4	13.25
Monessen, Pa. P16	13.15
Roebling, N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville, Ind. M8	8.05
Dover, O. G6	7.95
Fostoria, O. S1	7.95
Franklin Park, Ill. T6	8.05
Kokomo, Ind. C16	8.05
Massillon, O. R8	7.95
Milwaukee C23	8.15
Monessen, Pa. P7, P16	7.95
Pawtucket, R.I. N8	8.25
Rome, N.Y. (32) R6	7.95
Trenton, N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
Alabama City, Ala. R2	137
Aliquippa, Pa. J5	137
Atlanta A11	139
Bartonville, Ill. K4	139
Chicago, Ill W13	137
Cleveland A9	142
Crawfordsville, Ind. M8	139
Donora, Pa. A7	137
Duluth, Minn. A7	137
Fairfield, Ala. T2	137
Galveston, Tex. D7	145
Houston, Tex. S5	142
Johnstown, Pa. B2	137
Joliet, Ill. A7	137
Kansas City, Mo. S5	142
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	156
Rankin, Pa. A7	137
So. Chicago, Ill. R2	137
Sparrows Pt., Md. B2	139
Sterling, Ill. (1) N15	137
Worcester, Mass. A7	143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken, Pa. A3	$8.30
Wheeling, W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa, Pa. J5	138
Atlanta A11	140
Bartonville, Ill. K4	139
Crawfordsville, Ind. M8	139
Donora, Pa. A7	138
Duluth, Minn. A7	138
Fairfield, Ala. T2	138
Johnstown, Pa. B2	138
Joliet, Ill A7	138
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	157
Rankin, Pa. A7	138
Sparrows Pt., Md. B2	140
Sterling, Ill. (1) N15	138
Worcester, Mass. A7	144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
Alabama City, Ala. R2	$8.77
Buffalo W12	8.77
Donora, Pa. A7	8.77
Duluth, Minn. A7	8.77
Joliet, Ill. A7	8.77
Minnnequa, Colo. C10	9.02
So. Chicago, Ill. R2	8.77

BALE TIES, Single Loop

	Col.
Alabama City, Ala. R2	155
Atlanta A11	157
Bartonville, Ill. K4	157
Crawfordsville, Ind. M8	157
Donora, Pa. A7	155
Duluth, Minn. A7	155
Fairfield, Ala. T2	155
Joliet, Ill. A7	155
Houston S5	160
Kansas City, Mo. S5	160
Kokomo, Ind. C16	157
Minnequa, Colo. C10	160
Pittsburg, Calif. C11	179
So. San Fran., Calif. C10	179
Sparrows Point, Md. B2	157
Sterling, Ill. (1) N15	155

WIRE, Barbed

	Col.
Alabama City, Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville, Ill. K4	165
Crawfordsville, Ind. M8	164
Donora, Pa. A7	159†
Duluth, Minn. A7	159†
Fairfield, Ala. T2	159†
Houston, Tex. S5	164†
Johnstown, Pa. B2	162*
Joliet, Ill. A7	159†
Kansas City, Mo. S5	164†
Kokomo, Ind. C16	161†
Minnequa, Colo. C10	164**
Monessen, Pa. P7	162
Pittsburg, Calif. C11	179†
Rankin, Pa. A7	159†
So. Chicago, Ill. R2	159**
So. San Francisco C10	179**
Sparrows Point, Md. B2	164*
Sterling, Ill. (1) N15	163

WOVEN Fence, 9-15 Ga. Col.

Ala. City, Ala. R2	146**
Ala. City, 17 ga. R2	241**
Ala. City, 18 ga. R2	251**
Aliq'ppa, Pa. 9-14½ ga. J5	149‡
Atlanta A11	151
Bartonville, Ill. K4	152
Crawfordsville, Ind. M8	151
Donora, Pa. A7	146†
Duluth, Minn. A7	146†
Fairfield, Ala. T2	146†
Houston, Tex. S5	151†
Johnstown, Pa. (43) B2	119
Joliet, Ill. A7	146†
Kansas City, Mo. S5	151†
Kokomo, Ind. C16	148†
Minnequa, Colo. C10	151**
Monessen, Pa. 9 ga. P17	149
Pittsburg, Calif. C11	169†
Rankin, Pa. A7	146†
So. Chicago, Ill. R2	146**
Sterling, Ill. (1) N15	150

WIRE (16 Gage)	An'ld Galv. Stone	Stone
Ala. City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	
Cleveland A7	13.15	
Crawf'dsville M8	13.25	15.10
Fostoria, O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer, Mas. W12	13.15	14.70†
Pitts., Calif. C11	13.50	15.05†
So. Chicago R2	13.15	14.70
Sparrows Pt. B2	13.25	15.10*
Sterling (1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala. City, Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‡
Atlanta A11	7.00 7.55
Bartonville (48) K4	7.00 7.575
Buffalo W12	6.90 7.30†
Cleveland A7	6.90
Crawfordsville M8	7.00 7.55
Donora, Pa. A7	6.90 7.30†
Duluth, Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston, Tex. S5	7.15 7.55†
Jacksonville, Fla. M8	7.425 7.90
Johnstown B2 (48)	6.90 7.45*
Joliet, Ill. A7	6.90 7.30†
Kansas City, Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
Los Angeles B3	7.85
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer, Mass. W12	7.20 7.60†
Pitts., Calif. C11	7.85 8.25‡
Portsmouth, O. P12	6.90
Rankin A7	6.90 7.30†
So. Chicago R2	6.90 7.30**
So. S. Fran. C10	7.85 8.25**
Spar'wsPt. B2 (48)	7.00 7.55*
Sterling (1) (48) N15	6.90 7.475
Struthers, O. (48) Y1	6.90 7.40‡
Worcester, Mass. A7	7.20

*Based on 11c zinc; †5c zinc; ‡10c zinc; ‖Less than 10c zinc; **Subject to zinc equalization extras.

FENCE POSTS

	Col.
Chicago Hts., Ill. C2, I-2	150
Duluth, Minn. A7	150
Franklin, Pa. F5	150
Johnstown, Pa. B2	150
Marion, O. P11	150
Minnequa, Colo. C10	156
Moline, Ill. R2	156
So. Chicago, Ill. R2	150
Tonawanda, N.Y. B12	150
Williamsport, Pa. S10	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
4 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Fire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅞" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅞" to 1⅛", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS
(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great. Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1⅝	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2⅝	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer, Pa. U5	4.45	4.35	4.40	5.35
Ensley, Ala. T2	4.45	4.35	...	5.35
Fairfield, Ala. T2	...	...	...	5.35
Gary, Ind. U5	4.45	4.35	4.40	...
Indiana Harbor, Ind. I-2	4.45	4.35	4.40	...
Johnstown, Pa. B2	...	...	...	(16) 5.35
Lackawanna, N.Y. B2	4.45	4.35	...	5.35
Minnequa, Colo. C10	4.45	4.35	...	5.85
Steelton, Pa. B2	4.45	4.35	...	5.35
Williamsport, Pa. S10	...	...	...	5.35

TIE PLATES

Fairfield, Ala. T2	5.275
Gary, Ind. U5	5.275
Ind. Harbor, Ind. I-2	5.275
Lackawanna, N.Y. B2	5.275
Minnequa, Colo. C10	5.275
Seattle B3	5.425
Steelton, Pa. B2	5.275
Torrance, Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
Kansas City, Mo. S5	11.50
Lebanon, Pa. B2	11.50
Minnequa, Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind. Harbor, Ind. S13	6.75
Johnstown, Pa. B2	6.75

JOINT BARS

Bessemer, Pa. U5	5.425
Fairfield, Ala. T2	5.425
Ind. Harbor, Ind. I-2	5.425
Joliet, Ill. U5	5.425
Lackawanna, N.Y. B2	5.425
Minnequa, Colo. C10	5.425
Minnequa, Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So. Chicago, Ill. R2	7.30
Struthers, O. Y1	7.30
Youngstown R2	7.30

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield, Ala. T2	7.30
Ind. Harbor, Ind. I-2, Y1	7.30
Kansas City, Mo. S5	7.30
Lebanon, Pa. B2	7.30
Minnequa, Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So. Chicago, Ill. R2	7.30
Struthers, O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.i.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	33.00-43.00†
Bronze, 5000-lb lots	54.25-57.25†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	49.75-57.25
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	17.75-31.50‡
Tungsten	Dollars
Melting grade, 99%	
60 to 200 mesh	4.30-4.40
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c, H.S.-L.A.
(31) Widths over ⅝ in.; 0.40c for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 9.35c
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	..	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	..	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled 10%	Strip, Carbon Base, Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	57.50
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	59.00	59.50
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††‡		Carbon	Floor
Atlanta	6.79	7.75	8.37	43.43	7.05	...	6.92	8.89	....	7.08	7.09	8.83
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02§	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25²	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.57	45.28*	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.84	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45*	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.75	7.85	11.85	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	....
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73§	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	....	....	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98*	6.96	8.80	6.74	7.86§	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.60	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64§	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.61	....	7.35	7.18	8.30
San Francisco	7.55	8.95	9.45	51.65	7.80	...	7.55	10.05	13.35	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65³	10.15	....	7.80	...	7.80	10.85‡‡	14.55	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **⅛-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 999 lb and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ²—500 to 9999 lb; ³—4000 lb and over; ⁴—1000 to 1999 lb; ⁵—1000 lb and over; ⁷—1500 to 3999 lb; ⁸—2000 to 3999 lb; *—f.o.b. local delivery in lots of 10,000 lb and over.

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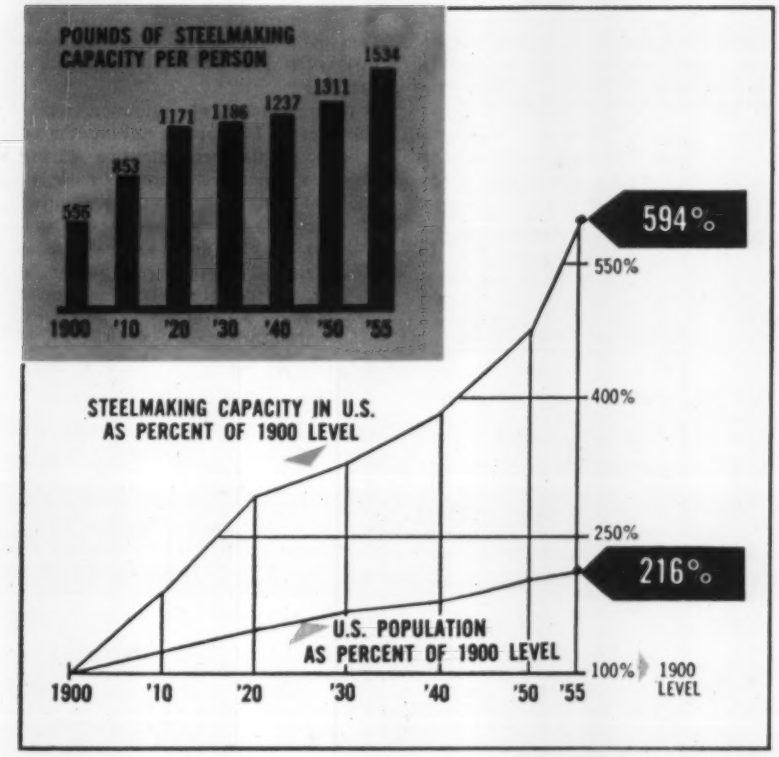

American Iron & Steel Institute

Nation's Appetite for Steel Grows

American Iron & Steel Institute reveals rapid increase in total and per capita capacity for first half of 1950s. Last half of decade will not be so spectacular

IF JUDGED by his supply of steel, the U. S. citizen's standard of living in 1955 is three times what it was at the turn of the century.

This is accounted for by a sixfold increase in steelmaking capacity while population increased only 216 per cent in the same period. This puts per capita capacity at 1534 lb, compared with only 556 lb in 1900. The sharp rise in both total and per capita capacity during the last five years is expected to level off during the second half of the decade because of the reduced rate of expansion and a higher rate of family formations and births. But both figures will continue to show more normal increases.

Growth Figures — The American Iron & Steel Institute reveals that in the 1950-1954 period, steel production averaged 99 million tons of ingots, or about 22 per cent greater than during the World War II and the postwar boom period. Last year fell below that average by 1.7 million tons, but the current one is headed for a near-record and will top that average. Even though 1954 was considered an "off" year, steel production still was 9 per cent over the 1940-1949 average, the best decade for steel before the 1950s.

Steelmaking in the first half of the 1950-1960 period was more than twice the average of the prosperous '20s; nearly three times that of the wartime teens and the depression '30s; and more than five times that of the 1900-1910 period.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 177 & 178

Any likelihood that supplies of cold-rolled sheets will catch up with demand in the next three months vanished with the prospect of automotive wage settlements without serious work stoppages. There has been little letup in ordering at Chicago. Some mills there are fully booked through the third quarter. A part of the tonnage on mill books is regarded as protective. Cancellations are likely in event the business tempo slackens.

Sheet order cutbacks by the automotive industry have been light. In New England they have been virtually nil. In general, however, some fair tonnage has been deferred. One such case is noted in the Philadelphia area. The effect of these cutbacks has been to cut down arrearages only slightly, but they do provide the mills a welcome breather considering their oversold situation in both hot and cold-rolled sheets. Most mills are virtually out of the market on these grades for the third quarter; also on galvanized, though the latter is in better balance as to shipment promises and deliveries.

Unless there is an auto strike by end of this month, the carryover in cold-rolled sheets and bars will be substantial. One producer of cold-rolled sheets will be delivering May tonnage in July, it was reported in the East last week. Much the same situation prevails with other makers. Galvanized sheetmakers are committed through the third quarter. Somewhat better balance is noted in specialties, but one producer of electrical sheets expects deliveries to be running a month behind schedule shortly.

Orders from appliance makers continue strong. Owing to model changeovers, demand from this quarter is not likely to continue at capacity level through the summer. Also, mill vacations and hot weather may result in some slackening of sheet production as the third quarter advances.

Steel Bars . . .

Bar Prices, Page 176

Hot carbon bar producers are booked solidly through August, and they haven't a great deal of capacity open for September. Most mills are overbooked and will have carryovers at the end of this quarter, averaging perhaps three to four weeks.

Pressure is beginning to build up for fourth quarter tonnage. The policy of some mills at least is to accept such tonnage on an if-and-when basis, but they are making no specific guarantees as to delivery.

In the East, warehouses have been pressing the hardest for tonnage, and this is especially so of jobbers who no longer are able to purchase foreign steel. Sources for the latter began

drying up early this year and now are virtually nil.

Fastener manufacturers are taking substantial tonnage, and cold drawers have been pushing for deliveries. There appears little question that consumers generally are building up inventories.

Pittsburgh interests think third quarter volume will about equal that for second quarter. Considerable optimism is noted among alloy barmakers, some expecting heavy demand from machine tool builders. Warehouses are expected to increase their take of bars next quarter.

Automotive demand in the Chicago market is expected to drop only moderately the next month or two. Agricultural implements and general demand seem likely to hold reasonably steady. The barmakers, however, are behind on deliveries and are unable to catch up.

Mill shipments vary in size and grade in New England. Orders there for August can be played for most of the smaller sizes. Tightest of all are the medium and high-carbon hot-topped large rounds, squares and flats. All is not smooth rolling with cold-finishing departments as supply balance is erratic. Forge shop and screw machine buying leads volume in the area.

Philadelphia Ordnance District has placed a $2,388,404 contract with the Budd Co., Philadelphia, for the manufacture of 90 mm shells. The company is completing a $4,174,300 antitank projectile order.

Plates . . .

Plate Prices, Page 176

Despite the lag in ship and railroad demand, plate producers see a full schedule of work ahead this summer. Some mills are virtually out of the market for the third quarter.

Specifications have not been fully entered against set-asides, but producers are not worrying on that score. They are confident the business is there. Actually, a few mills haven't definitely opened their books for September shipment tonnage. Reason: They are overbooked and wish to get their schedules more in balance before taking further orders.

Adding to optimism in the market over business prospects for the remainder of the year is the possibility of a definite pickup in shipwork. This may be felt appreciably in the fourth quarter.

Some spottiness is noted in demand at a few points, however. At Philadelphia, boiler requirements are less active and Navy needs have not been as robust as had been expected. This situation, however, is believed to be temporary as specifications are beginning to appear for fourth quarter, not only from the Navy but from other consuming areas as well.

District mills are entering little tonnage for fourth quarter, but they are entertaining inquiry for that delivery position. Most producers are oversold on sheared plates and are moving cautiously in winding up third quarter commitments. Universal plate supply is in reasonable balance, tonnage being available for late July shipment.

The larger plate fabricators continue to book fair volume in the Pacific Northwest, but smaller shops in the area find the going rough. Many are virtually out of backlog and report competition for orders extremely keen.

Mills in the Far West are diverting more ingot tonnage to production of plates in an effort to keep up with fast-moving construction projects.

A large electrical equipment manufacturer in Pittsburgh anticipates no change in plate consumption during the third quarter. Purchases for industrial equipment have been running substantially above those a year ago.

After July a drop in sheet sales could release more ingots for plate rolling. Currently, plate deliveries are running several weeks late.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 179

Sales of industrial fasteners are beginning to grow in the Pittsburgh area, responding slowly to the general increase in activity. A good third quarter is predicted. Railroads constitute 25 per cent of the sales of a large fastener producer in Pittsburgh. Sales were low early this year, but railroad purchasing is increasing, owing to anticipated summer maintenance work.

Structural Shapes . . .

Structural Shape Prices, Page 176

Structural steel demand is active. Despite the large amount of highway work that has featured the market over recent years, fabricators are of the opinion highway construction this year may be the heaviest on record. This view is pretty general over the country, but it is especially noted in the East and in New England where turnpike jobs have been taking large tonnages for bridges.

Substantial New York state highway work will be closed June 23. A variety of other projects also is active.

Award of the Macy branch store in Paramus, N. J., is expected momentarily. This may take 7500 tons. Mutual Benefit Life Insurance Co., Newark, N. J., is taking bids on 1000 tons for a new building there and will be in the market soon for another, to be known as its main building, requiring about 5000 tons.

More office building work than in a long time is going ahead in the New York metropolitan area (largest structural market). Apartment construction also is brisk. Industrial building is down from wartime levels, but has been steady over the last couple of years.

Bids were closed last week on sizable bridge work in the Philadelphia area, with a good scattering of miscellaneous construction pending. Most district fabricators hold comfortable backlogs. In the Midwest demand continues strong, and fabricators an-

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast‡
Deformed Bars, Intermediate, ASTM-A-305	$5.50*	$5.50*	$5.50*	$5.78*
Bar Size Angles	5.25*	5.25*	5.25*	5.53*
Structural Angles	5.00*	5.00*	5.00*	5.28*
I-Beams	5.00*	5.00*	5.00*	5.28*
Wide Flange Beams	5.15*	5.15*	5.15*	5.43*
Steel Sheet Piling	5.20	5.20	5.20	5.67
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	29.43	29.43	29.43	30.26
Barbed Wire (†)	6.05	6.05	6.05	6.23
Merchant Bars	5.50*	5.50*	5.50*	5.78*
Hot-Rolled Bands	6.00*	6.00*	6.00*	6.28*
Wire Rods, Thomas Commercial No. 5	5.40*	5.40*	5.40*	5.68*
Wire Rods, O-H Cold Heading Quality No. 5	5.85*	5.85*	5.85*	6.13*
Bright Common Wire Nails	7.15	7.15	7.15	7.45

‡Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling. †Per 82-lb, net, reel. *Nominal.

OD Sizes	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Looking for a Stainless Steel with a *New* combination of properties?

Here is a radically different chrome-nickel stainless developed by Carpenter to give you this unusual combination of fabricating and product benefits . . .

. . . work hardens *much slower* than any of the conventional 18-8 grades

. . . remains *non-magnetic* after severe cold working

. . . possesses corrosion resistance *equal to or better than* standard chrome-nickel stainless steels

This unusual combination of advantages is one reason why Carpenter *Stainless No. 10* is earning a unique place among engineered materials.

For example, it has opened whole new fields of applications in the fastener industry. With its slower work-hardening, fastener manufacturers can now produce on automatic machines severely cold headed and upset chrome-nickel stainless parts without process annealing. *No. 10* is also proving its economy on other jobs involving difficult coining, extrusion and swaging operations.

Another example is instrument parts which must remain non-magnetic after fabrication. After a 50% reduction, with a field of 200 Oersteds, permeability is about 1.002. After an 80% reduction: about 1.018. Will you be *next* to benefit from *Stainless No. 10?* How can *your* stainless product be improved, production simplified, costs lowered? Get the complete story on *No. 10.* Just drop us a line on your Company letterhead. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL — **Stainless No. 10**

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Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

ticipate no letup in activity until well on toward end of the year. Public work is prominent in current demand, but a substantial volume of private projects is also before the trade.

On the Pacific Coast, fabricators anticipate an active third quarter. Considerable tonnage awaits placement in the Pacific Northwest. Prospective business includes Tacoma's plans for building 28 schools.

Plain material deliveries are more extended in New England, notably wide flange beams. Little tonnage is available for September shipment, and one leading producer requires orders for structurals 30 days before the month of rolling. Bridge lettings are heavy in the area, but the last contract for the Massachusetts turnpike, including 17 spans, is out for estimates. Three interchanges also are to come.

Wire . . .

Wire Prices, Pages 178 & 179

Wire bookings for June shipment, also for post-vacation delivery, are the heaviest so far this year in the New England market. Shipments are out an additional two weeks and consumers are beginning to realize longer lead-time is necessary on more grades, notably high carbon. Forward buying of rods has filled schedules well into third quarter. Screw manufacturers are slow to place orders beyond July, being uncertain as to demand and specifications from larger users, including automotive.

Warehouse . . .

Warehouse Prices, Page 181

Prospects are that warehouse sales in June will edge May business slightly. Continuance of good volume for another month or so now seems assured, with major strikes in the automotive industry unlikely. In the East, distributors' order volume so far this month has been on the same high level as in May.

Mill buyers are active in the market, but most distributors are endeavoring to make sure regular customer needs are covered before heeding calls from other buyers. The tendency among some fabricators is to build stocks against a possible price increase, but slower manufacturing operations during the summer may serve to check buying for inventory somewhat.

Galvanized sheets are in better supply at Chicago warehouses—a condition just the reverse of the mill situation. A lot of cold-rolled sheets are moving out of warehouse in that district, and distributors are enter-

CHARLES R. COX

Portrait by Fabian Bachrach

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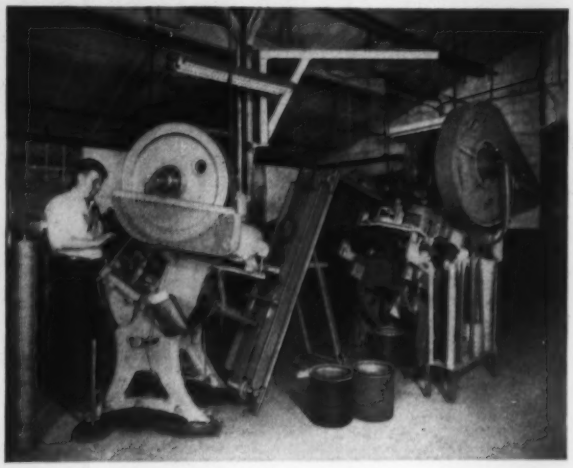

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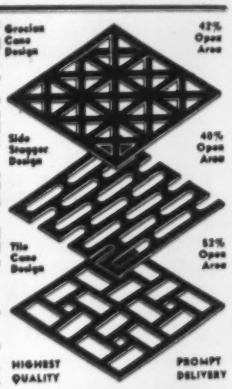

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taining strong demand for bars. Area sellers are somewhat concerned over supplies, with mills falling behind on deliveries.

Warehouse prices are steady and will likely remain so until after steel wage adjustments have been made and resellers know where they stand in relation to mill quotations. In the Los Angeles area distributors last week advanced prices on cold-rolled strip 10 cents per 100 lb to $11.85, and 60 cents on stainless sheets to $50.75.

Seattle area warehousemen are handicapped by interrupted truck service, due to a strike which makes it impossible to ship to customers at interior points.

Tubular Goods . . .

Tubular Goods Prices, Page 180

Little change in seamless or welded tube sales is expected in the early third quarter. Mechanical tube demand is strong from a wide variety of consumers. Warehouses report rapid turnover.

Seamless pressure tube continues to move slowly, but a new program of utility expansion now on drawing boards should revive sales in the fourth quarter.

Oil country tubular sales are holding steady. Consumers are placing orders for August delivery. In specialty tubing, consumers' orders are being taken for late July and August shipment.

There will be a good carryover from second to third quarter.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 176

This being the height of the building season, reinforcing bars are moving in heavy volume from the mills. Public work figures prominently, but substantial tonnage is being taken for private jobs. Indications are that business will continue good through the summer, though some slackening of inquiry is reported at points. Also, some price easiness continues though the market is a lot firmer than it was some months back.

Reinforcing tonnage placed in New England in the first five months this year was double that in the like period of 1954. Bridges accounted for the increase. Inquiry in the district is off at the moment, but Connecticut highway and bridge requirements are expected to provide strong market support in the second half of the year. The state uses more reinforcing per mile of highway than others in New England.

Some easiness in prices is noted

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Potsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5¼	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

in the area. Distributors, however, hold substantial backlogs where tonnage has been booked competitively. Those sellers holding out for the usual margin on bars are not sharing in the larger orders. Increasing volume throughout the East is required for special air defense Nike installations, taking approximately 100 tons each.

Pacific Northwest rolling mills are booking reinforcing tonnage steadily. Public and state highway projects continue to absorb large volume. Tacoma has opened bids for the Mayfield power dam, involving 3400 tons of reinforcing.

Pig Iron . . .

Pig Iron Prices, Page 181

Importers on the Pacific Coast report that foreign pig iron supply is tight. Imports to the Seattle area continue in small lots, but much more could be sold if tonnage were available. Foreign exports are government controlled. After caring first for domestic demand, producers are forced to serve favored buyers, such as those in the colonies.

European pig iron is priced too high to be acceptable in the Pacific Northwest, while South African and Australian iron is not available in plentiful supply. Indian iron is finding a wider market at home, thus reducing the tonnage available for export. In addition, rising economies in other parts of the world and high ocean freight rates make shipments here unattractive.

As a result, domestic consumers in the Northwest are using larger tonnages of American iron. Some plants are reported stocked six months ahead with foreign iron bought months ago, however.

In general, pig iron demand is holding. Some producers think that as the time draws near when higher prices are likely to be effected, there will be a last minute flurry to get tonnage in under the wire. There has been some protective covering of this nature, but consumption still is lagging at some points.

Shipments to foundries in the Chicago area are holding, but sellers anticipate some easing owing to a likely slowing down in auto production and approaching vacation suspensions. In the East, merchant iron buying in May was reported in about the best volume this year. Some of it was hedge buying against a price advance next quarter.

The prospects for higher prices, of course, is based on the likelihood of an increase in steel wages before the end of this month. Last year, pig iron prices did not advance in step with the steel wage increase, largely due to the sluggish demand prevailing at that time.

Iron Ore . . .

Iron Ore Prices, Page 189

The Great Lakes fleet hauled 2,937,929 gross tons of iron ore in the week ended June 6, reports the Lake Superior Iron Ore Association. This was the largest weekly tonnage moved this year. It compares with 2,314,003 tons in the like week a year ago. Cumulative shipments this year stand at 17,541,970 tons, against 13,309,267 in the like period of 1954.

Tool Steel . . .

Tool Steel Prices, Page 180

Shipments of high speed and tool steel (exclusive of hollow drill steel) totaled 9786 net tons in April, reports the American Iron & Steel Institute. This was off slightly from the 9869 tons shipped in March but was up sharply from the 7297 tons shipped in April a year ago.

Total tonnage shipped in the first four months this year was 35,220, compared with 31,299 tons moved in the like period of 1954.

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Use this continuous production furnace without modification for general and atmosphere work, including "Ni-Carb" ammonia-gas carburizing. Gentle tumbling action mixes the work and assures uniform heat treating.

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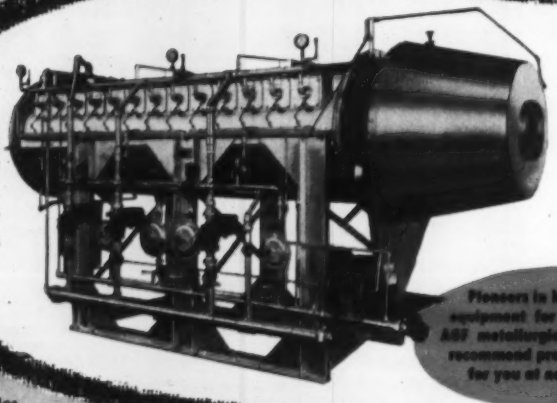
- Better control of processing atmosphere and temperature.
- Improved high production capacity combustion system.
- Increased thermal efficiency because only the work enters and leaves the furnace. Baskets, trays, chains and other troublesome mechanisms are eliminated.
- Alloy life is increased because the alloy remains within the furnace heating chamber at all times.



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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy, ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighting approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb on Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered, Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02. f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5.7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.ob. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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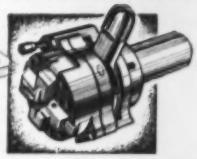

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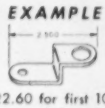

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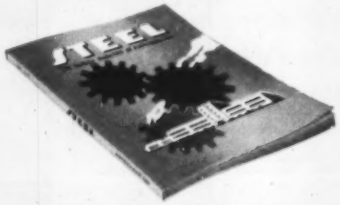

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Scrap . . .

Scrap Prices, Page 194

Philadelphia—The purchase of a round tonnage of No. 1 heavy melting steel by a Trenton, N. J., consumer at $37.50, delivered, has strengthened the market on that grade to a range of $35.50-$37.50, delivered. No. 1 bundles and No. 1 busheling also are holding at this range, although on a nominal basis.

Electric furnace bundles are $38.50-$39, delivered, on the basis of some recent buying. Low phos structurals and plate are $39.50-$41, delivered; heavy turnings, $33.50-$34, delivered. If there is any definite weakness among these latter grades, it is in heavy turnings, and even this appears temporary.

In the cast grades the situation is a bit mixed, with No. 1 cupola holding flatly at $36, delivered, reflecting mainly continued labor disturbances at the Florence, N. J., pipe foundry, and with malleable stronger at $45, delivered.

Basically, scrap is stronger than it was a week or ten days ago, with the movement of material abroad still having a sustaining influence. Labor unsettlement in England, affecting particularly transportation, has not resulted in a falling off in demand for scrap here by English buyers.

Pittsburgh—Mill stocks of blast furnace scrap are thought sufficient in view of probable lower operating rates this summer. Purchasing agents are waiting to determine how much their requirements could drop before placing large orders. Purchases the last week showed slightly higher prices paid for turnings and borings. Mills are paying more for stainless steel scrap—up to $240 for 18-8 bundles and solids.

Cleveland—The tone of the scrap market is a little stronger in this area. One sale of electric furnace material in the Valley at $35, delivered, serves to buoy the market, but chief support comes from prospective peaceful settlement of threatened labor trouble in the automotive industry. Prices are unchanged, but the view prevails among dealers and brokers that possibly the bottom of the market has been hit and that buying will likely pick up shortly.

Buffalo—Easier tendencies rule in the scrap market here. Buyers are limiting purchases, and dealer sentiment reflects the small tonnage movement. Mill yard stocks are substantial. Heavy boat receipts are being received. Bethlehem Steel Co. shut down one of its seven blast furnaces for relining.

New York—Brokers have reduced their buying prices on No. 2 bundles to $21-$22; on low phos structural and plate, to $33-$34. They also have lowered their prices on No. 1 cupola and heavy breakable cast scrap to $31-$32. Prices on other grades are unchanged, reflecting a fairly steady demand from both foreign and domestic consumers.

Boston—No. 1 heavy melting steel for district delivery is off $1 to $2 a ton to $28.50-$29 within short freight haul. For eastern Pennsylvania, brokers are quoting down to $27.50, shipping point. The price trend on other steel grades inclines toward the soft side, with export loadings less active. Yard stocks of top grade heavy melting are lower, the result of shipments before demand and prices went off.

Cincinnati—The scrap market here weakened last week as the local consumer purchased moderate tonnages. All No. 1 grades declined 50 cents a ton to $31-$32. No. 2 heavy melting dropped $1 to $26-$27, while machine shop turnings were off 50 cents to $17.50-$18.50.

Chicago—A slightly stronger tone is discernible in the scrap market here. Curiously, it developed before prospects of strikes in the automotive industry lessened. Only in a few instances, such as No. 1 dealer bundles, turnings and borings, has the better feeling resulted in higher prices. In these, the advance is $1 a ton. Steel production is expected to hold close to capacity for the next two months.

St. Louis — Melting steel scrap prices have softened about $1 under mills' overstocked position. Falling operating rates have put ground stocks over 90 days. One mill, however, is taking all it can get at current prices.

Birmingham—The cast market is steady, but there is considerable weakness in steel scrap. Latest purchases were at reduced prices, shoveling turnings being off $6 a ton.

Los Angeles—Mill purchases have eased, with prices showing definite softness. No changes are apparent, however. Despite the lag in buying, consumption is active, leading dealers to hope the mills will enter the market soon when their inventories are reduced.

Seattle—Sustained activity is expected in the scrap market over coming weeks. Recent firmness and comparatively high prices have attracted considerable tonnage from the interior.

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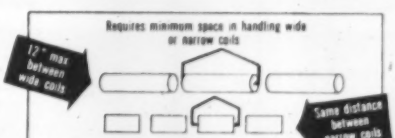
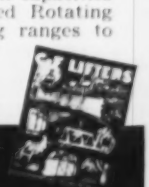
ADVANTAGES

- 1 Lifter handles wide range of coil sizes
- Requires minimum of only 10" to 12" between piles —saves storage room
- 1 man operation — eliminates hookers
- Positive grip on coil — no damage to material

• C-F Coil Lifters are saving time and labor in many plants and warehouses because they can pick up, carry and set down a coil of steel faster and safer than any other method. Infinite jaw openings permit handling a very wide range of coil widths . . . carrying legs open fast, stay open until operator closes them on coil. Narrow legs require minimum space between piles — a space saving advantage. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for illustrated Bulletin.





CULLEN-FRIESTEDT CO.

1308 South Kilbourn Avenue • Chicago 23, Illinois

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 8	$35.00
June 1	34.67
May Avg.	34.87
June 1954	27.92
June 1950	39.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	31.00-32.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	*20.50-21.50*
Mixed borings, turnings	*20.50-21.50*
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Cut structurals, 5 ft lengths	38.00-39.00
Heavy turnings	33.00-34.00
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00-38.00
Rails, 2 ft and under	48.00-49.00
Rails, 18 in. and under	49.00-50.00
Rails, random lengths	44.00-45.00
Railroad specialties	43.00-44.00

Stainless Steel Scrap

18-8 bundles & solids	*225.00-240.00*
18-8 turnings	*110.00-115.00*
430 bundles & solids	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	31.00-32.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	43.00-44.00
Heavy breakable cast	33.00-34.00
Unstripped motor blocks	25.00-26.00
Brake shoes	30.00-31.00
Clean auto cast	44.00-45.00
Burnt cast	32.00-33.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt	34.00-35.00
R.R. malleable	43.00-44.00
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	44.00-45.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	43.00-44.00
Angles, splice bars	45.00-46.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	200.00-210.00
18-8 turnings	100.00-110.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Machine shop turnings	16.00-17.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	33.00-35.00
No. 2 heavy melting	*28.00-29.00*
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	*33.00-34.00*
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-35.00
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals, 3 ft	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Stove plate	*34.00-35.00*
Unstripped motor blocks	29.00-30.00
Clean auto cast	*45.00-46.00*
Drop broken machinery	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Angles, splice bars	43.00-44.00
Rails, rerolling	51.00-52.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	95.00-100.00
430 bundles & solids	105.00-110.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended June 8)

	No. 1 Heavy Melting High	Low	Close
Oct.	36.00	35.75	36.00
Jan.	....	....	....

Sales (160-ton units) 4 October.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.50
No. 2 heavy melting	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	*15.00-16.00*
Short shovel turnings	*19.00-20.00*
Machine shop turnings	*17.00-18.00*
Electric furnace bundles	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths	*40.00-41.00*
Angles, splice bars	43.00-44.00
Std. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	*35.50-37.50*
No. 2 heavy melting	32.50
No. 1 bundles	*35.50-37.50*
No. 2 bundles	26.50-28.00
No. 1 busheling	*35.50-37.50*
Electric furnace bundles	*38.50-39.00*
Machine shop turnings	21.50
Mixed borings, turnings	21.50
Short shovel turnings	24.00-25.00
Structurals & plate	*39.50-41.00*
Heavy turnings	*33.00*
Couplers, springs, wheels	40.50-41.00
Rails crops, 2 ft & under	50.00-51.00

Cast Iron Grades

No. 1 cupola	*36.00*
Malleable	*45.00*
Heavy breakable cast	40.00-41.00
Drop broken machinery	44.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00-27.50
No. 1 bundles	30.00-31.00
No. 2 bundles	*21.00-22.00*
Machine shop turnings	12.00-13.00
Mixed borings, short turnings	13.00-14.00
Short shovel turnings	15.00-16.00
Low phos. (structural & plate)	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	*31.00-32.00*
Unstripped motor blocks	22.00-23.00
Heavy breakable	*31.00-32.00*

Stainless Steel

18-8 sheets, clips, solids	235.00-240.00
18-8 borings, turnings	105.00-110.00
430 sheets, clips, solids	95.00-100.00
410 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.50-29.00*
No. 2 heavy melting	17.00-18.00
No. 1 bundles	27.00-28.00
No. 2 bundles	16.00-17.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
No. 1 cast	31.00-32.00
Mixed cupola cast	29.00-30.00
No. 1 machinery cast	34.00-35.00

BUFFALO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	29.00-30.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	21.00-22.00
No. 1 busheling	*31.00-32.00*
Machine shop turnings	*17.50-18.50*
Mixed borings, turnings	17.50-18.50
Short shovel turnings	21.00-22.00
Cast iron borings	17.50-18.50
Low phos., 18 in.	37.00-38.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	32.50-33.50
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*30.00*
No. 2 heavy melting	*28.00*
No. 1 bundles	*30.00*
No. 2 bundles	*23.50*
Machine shop turnings	*15.00*
Short shovel turnings	*17.00*

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	*32.00*
Clean auto cast	43.00
Stove plate	*33.50*

Railroad Scrap

No. 1 R.R. heavy melt.	34.50
Rails, 18 in. and under	46.00
Rails, random lengths	*40.00*
Rails, rerolling	50.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths	34.00

LOS ANGELES

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	8.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 1 busheling	30.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	12.00
Cast iron borings	12.00
Cut structurals	30.00
Heavy turnings	11.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

SCRAP PRESCRIPTIONS EXPERTLY FILLED

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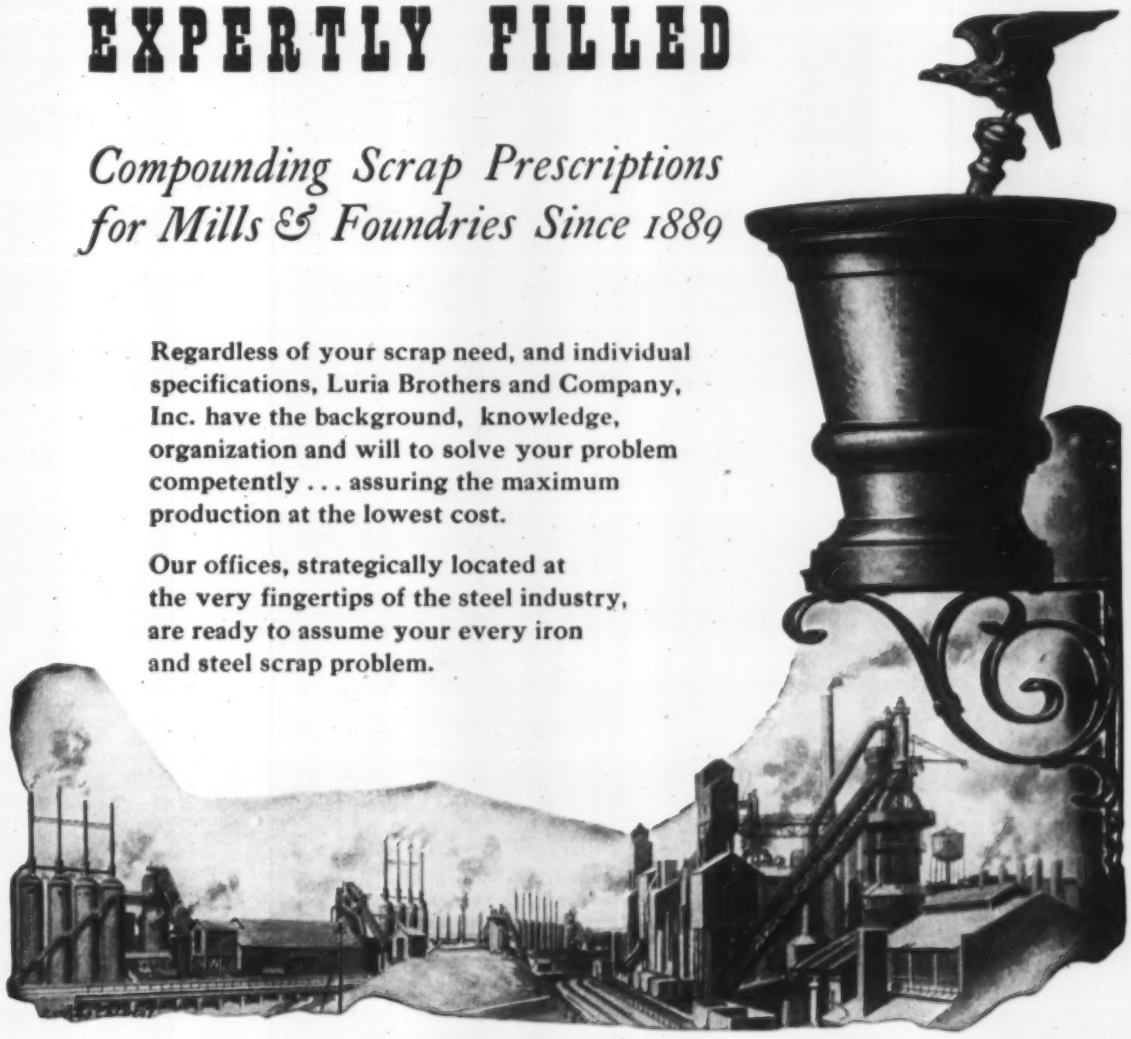

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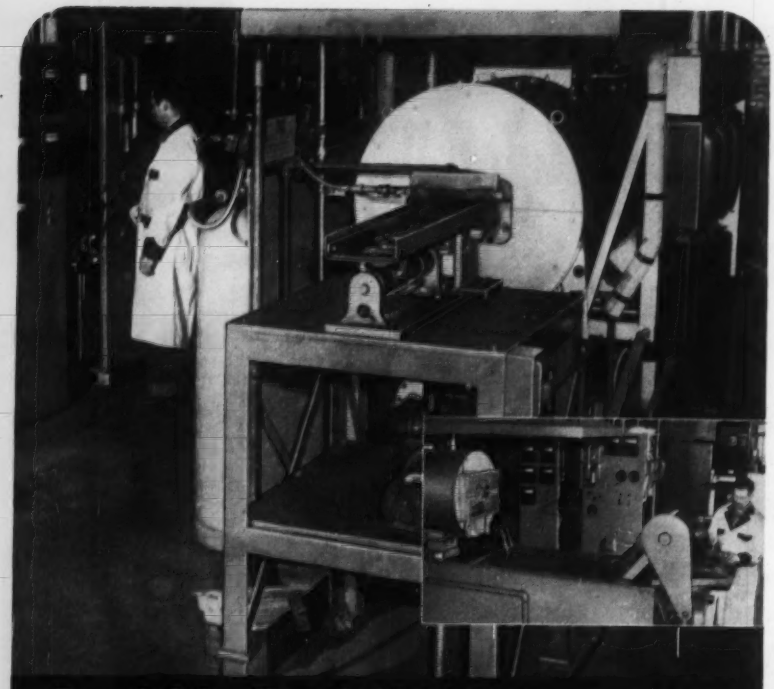

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Gage blocks, industry's standard of precision measurement require accuracies within millionths, hardness adequate to resist wear and freedom from distortion and warpage. DoALL Gage Blocks, distinguished throughout the world for excellence, are heat treated to meet rigid specifications. —

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STRUCTURAL STEEL PLACED

2000 tons, plant, Glidden Paint Co., Baltimore, to Belmont Iron Works, Eddystone, Pa.

1600 tons, Owens-Illinois Glass Co. warehouse, Portland, Oreg., to Faught & Gray, Portland.

1275 tons, 19-story office building, Madison Ave. and 59th St., New York, through Joseph T. Plitz, general contractor, to Harris Structural Steel Co., that city.

940 tons, additional bracing for coffer dam work, Navy yard, Brooklyn, N. Y., through Corbetta Construction Co., to Bethlehem Steel Co., Bethlehem, Pa.

740 tons, appliance services shop and warehouse, General Electric Co., North Bergen, N. J., to Ingalls Iron Works, Verona, Pa.

670 tons, ventilator building, Weehawken, N. J., in connection with the third tube of the Lincoln tunnel under the Hudson river, through James Mitchell, to Bethlehem Steel Co., Bethlehem, Pa.

670 tons, factory building, Palnut Co., Mountainside, N. J., through Austin Co., engineer and general contractor, to Elizabeth Iron Works Inc., Union, N. J.

600 tons, classroom-laboratory building, Northeastern University, Boston, to West End Iron Works, Cambridge, Mass.; John A. Volpe Construction Co., Malden, Mass., general contractor.

500 tons, municipal air base, National Guard facilities, Burlington, Vt., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Tandy & Allen Construction Co., Hackensack, N. J., general contractor; reinforcing to Joseph T. Ryerson & Son Inc., Boston.

500 tons, addition, St. Joseph Hospital, Stamford, Conn., to Schacht Structural Steel Co., New York; F. D. Rich Co. Inc., Stamford, general contractor; reinforcing to Norwich Steel & Supply Co., Norwich, Conn.

300 tons, hangars, air base, Myrtle Beach, S. C., to Bristol Iron & Steel Co., Bristol, Va.; Craig-Robinson Construction Co., Columbia, S. C., general contractor; bars to Ceco Steel Products Co., Atlanta.

250 tons, regional high school, Lincoln-Sudbury, Mass., to Groisser & Shluger Iron Works, Somerville, Mass.; G. F. Rand & Son, Boston, general contractor.

210 tons, state highway bridges, Dennis-Harwich-Brewster, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Campanellardi Co., Hillsgrove, R. I., general contractor.

215 tons, addition, St. Andrews School, Middletown, Del., to Robinson Steel Co., Philadelphia.

185 tons, bridge, Allagash Plantation, Me., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Carelton C. Denico, Caribou, Me., general contractor.

185 tons, addition, building 64, General Electric Co., Erie, Pa., to the Electroweld Mfg. Corp., that city.

165 tons, state highway bridge, New Hampshire, to Bethlehem Steel Co., Bethlehem, Pa., through Clayton W. Chase, Milford, N. H., general contractor.

100 tons, government-furnished, four aerial towers, Tillamook, Oreg.; A. V. Phillips, general contractor, Seattle, low at $92,217 to U. S. Engineer.

STRUCTURAL STEEL PENDING

7500 tons, approximately, Macy branch store, Paramus, N. J., early award expected.

2950 tons, highway structures, Indiana toll road, Gary, Ind.; bids June 22, Indianapolis; also 26,200 linear feet of steel piling and 7300 linear feet of metal handrail.

1800 tons, bridges and viaduct structure, Somerville, Mass.; A. V. Taurasi & Co. Inc., Somerville, low, general contract; also 755 tons, reinforcing bars.

1760 tons, Massachusetts turnpike, Chicopee-Ludlow, Mass., bids June 16, Boston; also 1320 tons, reinforcing bars.

1386 tons, state bridge superstructure, section 37-AB, Carbon county, Pa., bids June 29.

1000 tons, surgical center, Department of Public Works, 1221 Spofford Ave., Bronx, New York, bids June 22.

1000 tons, office building, Mutual Benefit Life Insurance Co., Newark, N. J., bids asked; another building, the main structure, in-

volving 4000 to 5000 tons, will be up for figures later.

894 tons, state bridge superstructure, sections 37-DE, Luzerne county, Pa., bids June 29.

835 tons, bridges, Massachusetts turnpike, Lee-Becket, Mass.; Lizza & Sons, Oyster Bay, N. Y., low, general contract; also 475 tons, reinforcing bars.

415 tons, four bridges, including two 4-span stringers, Massachusetts turnpike, Otis-Blandford, Mass.; S. J. Groves & Son Inc., New York, low, general contract.

350 tons, institutional building, General State Authority, Clarks Summit, Lackawanna county, Pa., June 29.

285 tons, state bridge work, York, Pa.; Jack & Jim Maser, Brownstown, Pa., low on general contract.

250 tons, diecasting shop, Bendix Aviation Corp., Teterboro, N. J., pending.

185 tons, state bridge, Allagash Plantations, Me.; Carleton C. Denico, Caribou, Me., general contractor.

180 tons, three single composite and skew span bridges, Derby-Ansonia, Conn.; Jarvis Construction Co., Manchester, Conn., general contractor.

160 tons, Washington state truss bridge, Wahkiakum county; bids to Olympia, Wash., June 21.

150 tons, state bridge work, Bergen county, N. J., bids June 21.

100 tons, WF beam bridge, including bars, Albany, Vt.; bids June 17, Montpelier, Vt.

100 tons, including bars, state highway bridge, Eliot-South Berwick, Me.; Frank Rossi, Gardiner, Me., general contractor.

100 tons, including bars, state highway bridge, Buckland, Mass.; Warner Bros. Inc., Sunderland, Mass., general contractor.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1045 tons, seven bridges, Massachusetts turnpike, Palmer, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Berlanti Construction Co., Harrison, N. Y., general contractor; Bethlehem also awarded several hundred tons, steel piling.

900 tons, Packer Ave. approach to Philadelphia-Gloucester bridge over the Delaware river, Philadelphia, to American Steel Engineering Co., that city; 2500 tons of structural shapes still pending.

450 tons, mall building, Fourth and Chestnut streets, Philadelphia, through Shelby Construction Co., New Orleans, owner, to American Steel Engineering Co., Philadelphia.

340 tons, state highway bridges, Canton-Dedham-Westwood, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; J. F. White Contracting Co., Cambridge, Mass., general contractor.

250 tons, classroom-laboratory building, Northeastern University, Boston, to Northern Steel Inc., Medford, Mass.; John A. Volpe Construction Co., Malden, Mass., general contractor.

200 tons, Sheraton Hotel, Philadelphia, to American Steel Engineering Co., that city; 3815 tons of structurals went to Bethlehem Steel Co., Bethlehem, Pa., recently noted.

150 tons, military installation, Kotzebue, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Manson-Oberg Co., Seattle, general contractor.

130 tons, regional high school, Lincoln-Sudbury, Mass., to Barker Steel Co., Watertown, Mass.; G. F. Rand & Son, Boston, general contractor.

REINFORCING BARS PENDING

3350 tons, Tacoma's Mayfield dam project; bids in June 3.

1100 tons, highway structures, Indiana toll road, Gary, Ind.; bids June 22, Indianapolis.

525 tons, Hogback dam, Harland-Colebrook, Conn.; bids July 6, Metropolitan District Commission, Hartford, Conn.

375 tons, concrete deck, Connecticut river, West Springfield-Chicopee, Mass.; bids June 14, Boston.

174 tons, utilidors, Elelson Air Base, Alaska; Morrison-Knudsen Co., Seattle, low base bid.

PLATES . . .

PLATES PLACED

500 tons, fuel storage facilities, two Alaska military installations, to Hydraulic Supply Mfg. Co., Seattle; Manson-Oberg Co., Seattle, contractor.

150 tons, storage tank, air base, Glasgow, Mont., to Pittsburgh-Des Moines Steel Co., Seattle.

PLATES PENDING

250 tons, two elevated steel water tanks, Newton Center, Mass.; Pittsburgh-Des Moines Steel Co., Pittsburgh, low on both alternates.

PIPE . . .

CAST IRON PIPE PENDING

1300 tons, 12 to 4 in., Kin County, District No. 13, Mercer Island, Wash.; bids June 13.

STEEL PIPE PLACED

100 tons, fabricated steel pipe, taconite plant, Erie Mining Co., Emco, Minn., to the Continental Boiler & Sheet Iron Works.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago & Northwestern, 22 diesel units, of which nine 1750-hp road switchers were placed with the Electro-Motive Division, General Motors Corp., La Grange, Ill., ten 1600-hp road switchers with Fairbanks, Morse & Co., Chicago, and three 1000-hp switchers with Alco Products Inc., New York.

Norfolk & Western, eight general purpose diesel electric locomotive units, divided equally between Electro-Motive Division, General Motors Corp., La Grange, Ill., and Alco Products Inc., New York.

LOCOMOTIVES PENDING

Norfolk & Western, eight general purpose diesel locomotive units, authorized.

RAILROAD CARS PLACED

Norfolk & Western, 500 steel boxcars, to the Pullman-Standard Car Mfg. Co., Chicago.

Northern Pacific, 20 covered hopper cars, to General American Transportation Corp., Chicago.

Virginian, 300 seventy-ton covered hopper cars, to its own shops.

RAILROAD CARS PENDING

Gulf, Mobile & Ohio, 200 fifty-ton box cars; bids asked.

Transportation Materiel Command, Marietta, Pa., 208 flatcars for foreign service, bids June 20.

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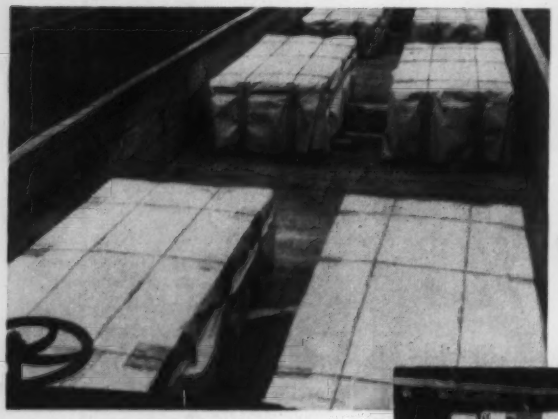

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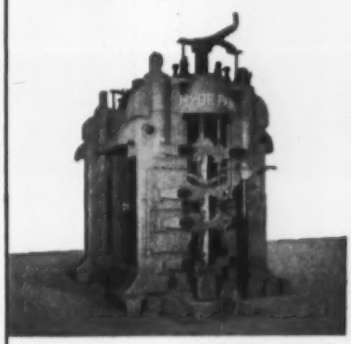

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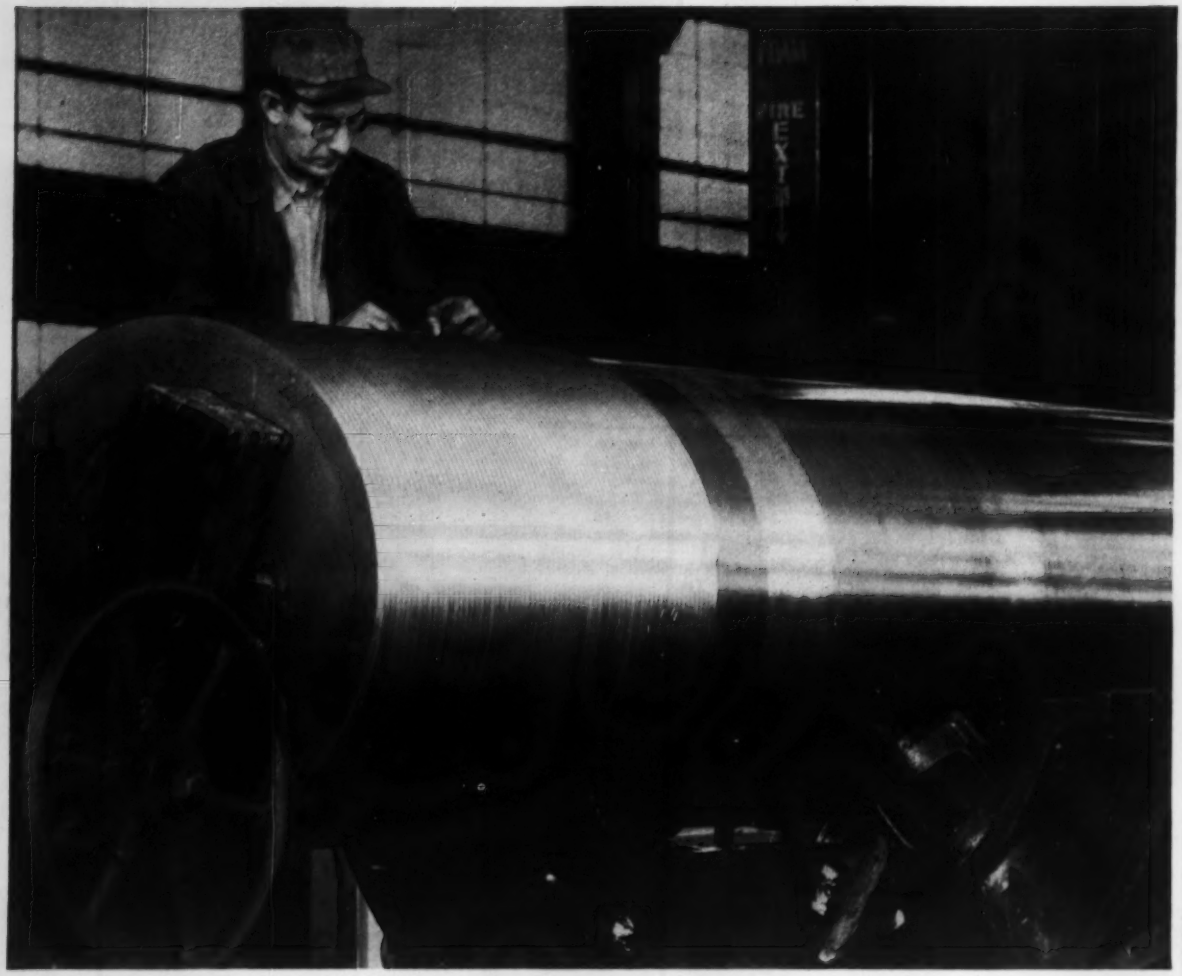

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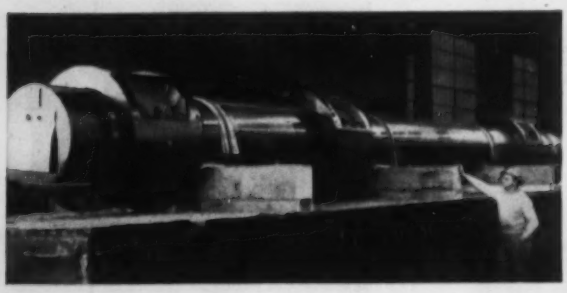

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